

**EMOTIONAL INTELLIGENCE:
CORRELATES WITH
EXERCISE ATTITUDES**

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By

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ABSTRACT

Theoretical developments of emotional intelligence (EI) are jeopardized by the inability of empirical studies to keep pace with its intense surge to the forefront of both lay and academic communities. Due to the paucity of empirical evidence, claims of the contributions of EI are met with speculation in the scientific community. Furthermore, EI is conceptualized and measured in a variety and often, diverging ways.

Subsequent to indications from previous literature that EI shows promise to be linked to the field of health and psychological well-being (Austin, Saklofske, & Egan, 2005), the primary aim of this study was to investigate the concurrent criterion validity of a mixed model conceptualization of EI with self-reported exercise attitudes by comparing two subsamples of university students, (Mean Age = 22 years; 72% Female, 28% Male; NonKinesiology $n_1 = 271$, Kinesiology $n_2 = 127$).

The finding of a weak overall correlation fails to provide concurrent criterion validity to the BarOn (2002) conceptualization of EI with exercise attitudes as measured by HBQ (Austin, unpublished), $r(398) = .13$, $p = .013$. This finding is further substantiated by the lack of significant findings in an ANOVA and a lack of practical significance in a MANOVA. While the criterion group had significantly stronger beliefs of the benefits of exercise, $F(1, 394) = 47.54$, $p < .001$, $\eta^2 = .11$; no significant difference between the means of the Composite EI was found between the subsamples for the main effect (field of study) or for the interaction effect (field of study \times sex): $F(1, 394) = 0.08$, $p = .78$; $F(1, 394) = 1.82$, $p = .18$, respectively. Additionally, the

MANOVA findings determined that only 1.6% of the overall variance could be attributed to the model effect of self-reported activity level and exercise attitude with EI.

The secondary purpose of this study was to examine the sex differences in the relationship of EI and exercise attitudes. The scales for the female subsample were not significantly correlated, $r(287) = .07, p = .25$; whereas, a low and significant correlation was found in the male subsample, $r(111) = .37, p = .001$. The finding is noteworthy and appears to suggest that the contributing factor to the significant, but weak overall correlation, was obtained from the male sector.

Although, the study does find the BarOn EQ-i:S instrument to be a good measure with strong internal consistency reliability and large intercorrelations with its components, the findings point to concerns as to what is being measured and the degree to which the measure overlaps with the personality domain.

Acknowledgements

If I have seen further, it is by standing on the shoulders of giants.

-Sir Isaac Newton, letter to Robert Hooke

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Dedication

“It was a dark and stormy night...”

Snoopy, I beat you to it.

In memory of

Peter D. Gultzan, my father,

Who had a heart of gold and a hard working ethic that I try to keep up with;

Robert (Bob), my brother, philosopher, and friend.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Goleman (1995) challenged understandings of intelligence and popularized the concept of emotional intelligence when his book, *Emotional Intelligence*, catapulted to widespread public attention just weeks off the press. The popularity was marked with other indicators that include: the cover display and feature article in *Time* (Gibbs, 1995, October 2), listed as a *New York Times* best seller, and translated into 30 languages (Emmerling, 2004). More importantly, it was through a seminal dissertation by Payne (1986) and extensive theoretical and empirical studies by Salovey and Mayer (1990) and Bar-On (1997) whereby emotional intelligence entered the scientific community.

In the *Handbook of Emotional Intelligence*, Mayer, Salovey, and Caruso (2000) titled their chapter: *Emotional Intelligence as zeitgeist, as personality, and as mental ability*. This title continues to capture the interest, the developments, the debate, and the controversy surrounding the construct.

Emotional intelligence as zeitgeist refers to an intellectual and cultural trend that was signaled when Daniel Goleman's book on emotional intelligence catapulted to the *Time* best seller list and was translated into 30 different languages. Matthews, Zeidner, and Roberts write "few fields of investigation appear to have touched so many disparate areas of human endeavor, in its inception, as has emotional intelligence" (2002, p. 4). Emotional intelligence as zeitgeist marks an intersection of two areas of cultural tension in Western society (Mayer et al., 2000). First, the tension in Western

thought between emotion and reason as two opposite ends of a paradigm whereby suggesting emotional intelligence as an oxymoron. Payne's (1986) landmark thesis introduces the concept and framework of emotional intelligence as a way of addressing the ills produced by a longtime suppression of emotion:

Many of us fear uncontrolled emotional expression, such as weeping, with an intensity that rivals our fear of death. Is it any wonder, when we consider the strength of suppression among our ancestors? Some of us are direct descendants of those who were locked up and tortured for their expression [of] emotion. Others of us are descendents of those who administered the torture ... We must come to terms with this [liberating feelings by raising emotional intelligence] or we will continue to raise generations of adults who behave emotionally ignorant – and therefore, destructive ways (p. 21 and then p. 441 as cited in Mayer, Salovey, & Caruso, 2000, p. 96).

The second area of cultural tension in Western society addressed by the concept of emotional intelligence was the tension between egalitarianism and elitism, marked by the publication of two books. *Emotional Intelligence* (Goleman, 1995) followed immediately after the controversial and pessimistic view of intelligence testing in *The Bell Curve* (Herrnstein and Murray, 1994). The emotional quotient (EQ) was presented as the equalizer and as “powerful, and at times more powerful, than IQ” with the additional benefit in that “crucial emotional competencies can be learned” (Goleman, 1995, p. 34 as cited in Mayer, Salovey, Caruso, 2000, p. 97).

Emotional intelligence as zeitgeist is as the construct itself implies: both science and sensation. However, the question remains; is it simply a fad caught up in the media and sensationalism, or is it a viable and beneficial construct for the scientific community and society at large?

1.2 Statement of the Problem

While emotional intelligence (EI) as a construct is relatively new, the historical roots can be traced to the time of Plato. The nature of EI has attributes found in the realms of emotion, consciousness, philosophy, and intelligence. Society at large has embraced the concept of EI, but not so in the scientific community. Although there are claims that EI tests can predict beyond that proportion of variance that general intellectual ability predicts, and that literacy of emotions can lead to happier lives, the scientific investigation of EI is sparse and lacking clarity or consensus.

Although the scientific community has revealed weaknesses and shortcomings in the investigation of EI as a construct, there is some evidence that EI is a viable construct. As indicated by Matthews, Roberts, and Zeidner:

Stripped of scientific trappings, it remains plausible that EI is nothing but the latest in a long line of psychological fads. On the other hand, because systematic scientific research is just beginning, EI could indeed mature into a construct that is theoretically meaningful, empirically important, and practically useful (2004, p. 179).

Messick wrote that validity is “an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment” (1989, p. 13). Concurrent criterion validity is one way of providing evidence that a measure is assessing what it claims to be assessing by correlating with measures of related constructs in a nomological framework where correlation is expected.

Previous studies have been extensively used within the context of construct and instrument development; research is now expanding into examining the relationships of

EI in such external arenas as health, business, and industry (Austin, Saklofske, Galloway, & Davidson, in preparation).

1.3 Purpose of this Study

The purpose of this study was to investigate the validity of the construct of EI by examining concurrent criterion validity with exercise attitudes. To do so, the methodology involved a nonexperimental approach. EI was framed within the Bar-On (1997) mixed model, and health attitude was framed within the Health Belief Model (HBM, Becker, 1974). A questionnaire, consisting of measurement scales using the BarOn Emotional Quotient Inventory: Short Version (BarOn EQ-i:S; Bar-On, 2002) for EI and Health Belief Questionnaire¹ (HBQ; Austin, unpublished) for exercise attitudes, was administered to two distinct, convenience samples of undergraduate students in the field of kinesiology and a nonkinesiology field. This study focused on two of the scales within the questionnaire:

1. Composite EI: a composite scale score composed of the BarOn EQ-i:S factor scales that assesses how emotionally and socially effective individuals are in dealing with daily demands.
2. HA Benefit: a factor scale score within the HBQ that assesses how strong the individual believes exercise to be beneficial to health.

This study examined the relationship of Composite EI with HA Benefit by comparing a group that consisted of a majority of exercisers with a mixed group of

¹ At the time of the study, the questionnaire was unpublished. Specific queries about the questionnaire may be directed to its author: Dr. Elizabeth Austin; School of Philosophy, Psychology, and Language Science; The University of Edinburgh, Scotland.

exercisers. The statistical analyses, using SPSS version 13 (SPSS, 2004), consisted of correlations, univariate analyses (ANOVAs), and a multivariate analysis (MANOVA).

1.4 Research Questions

This study investigated the relationship between EI and exercise attitudes to answer the following key questions:

1. Is there a correlation between EI and exercise attitudes and in particular, do undergraduate females/males in the field of Kinesiology have high EI as measured by the EI Composite scores on the BarOn EQ-i:S as well as strong beliefs of the benefits of exercise as measured by the HA Benefit scores on the HBQ?
2. Do undergraduate females/males in the field of Kinesiology self-report a higher exercise activity level than undergraduate females/males in NonKinesiology fields of study?
3. Do undergraduate females/males in the field of Kinesiology have stronger beliefs of the benefits of exercise as measured by higher HA Benefit scores than NonKinesiology undergraduate females/males?
4. Do undergraduate females/males in the field of Kinesiology have higher EI as measured by the BarOn EQ-i:S Composite scale than NonKinesiology undergraduate females/males?
5. Are exercise attitudes, as measure by the HA Benefit scale, and self-reported exercise activity level different for students in the three levels of EI: low quartile of EI Composite scores, middle two quartiles of EI Composite scores, and high quartile of EI Composite scores?

1.5 Delimitations

This study used self-reported measures of EI and exercise attitude. As is the nature of self-report measures, the data are a reflection of the respondents' perceptions to the items requested and cannot always be interpreted as actual fact. Considerations of the implications of self-reported data are necessary in the interpretation of the results.

Second, the data are based on a sample of undergraduate students taken from a western Canadian university and between the ages of 18 and 29 years. As such, generalizability to other ages and other populations is limited due to the developmental and contextual factors that impact on the emotional makeup of individuals. Some aspects of the conclusions may be applied to similar populations and locales. On the other hand, the methodology used in the research may provide insights to future research that may be used for generalizability to other populations.

1.6 Ethical Considerations

Ethics approval to conduct the study was obtained from the University of Saskatchewan Research Ethics Board. See Appendix A. There were no aspects of this study that involved any risk to the participants or involved the deception of participants. The researcher worked with voluntary and informed participants and obtained written consent from all participants. Appendix B indicates the consent form that was used for this study. Confidentiality was insured and data are reported in aggregate form. All data are secured in a locked facility and will be stored for a minimum of five years, in accordance with University of Saskatchewan regulations.

1.7 Significance

This study investigated the relationship of EI and exercise to provide further empirical evidence to the validity of EI. Particularly when a construct is new, empirical evidence contributes to a higher degree of validity to the theoretical implications and developments of the construct.

In addition, with evidence of criterion validity, other theoretical developments of the relationships can be applied to health issues. Specifically, increasing incidences of obesity and rising levels of sedentary lifestyles in children and adults are a concern as a result of the positive correlation with heart disease and chronic illnesses. Regular exercise has been shown to impact and influence a healthier lifestyle. With an increased understanding of the factors that can aid in understanding exercise attitudes, health administrators and officials can be more focused in successful intervention programs.

CHAPTER 2: LITERATURE REVIEW

This chapter contains a summary of an examination of the literature related to EI and health attitudes, beginning with a brief overview of the two underlying constructs of EI: emotions and intelligence. A description of the two primary models, currently used in theoretical developments of the conceptualization of EI, is followed by a section with a summary of empirical studies that have linked EI with health behaviour. The review includes an investigation of the current models used to study health attitudes with an emphasis on the Health Belief Model (HBM) as well as a section on characteristics of self-reported measurement.

2.1 Emotional Intelligence

2.1.1 Intelligence

A brief review of the developments occurring in the realm of human intelligence theory is necessary in order to understand why the study of EI is viable.

The psychometric approach, based on the presumption that intelligence is measurable (Binet & Simon, 1916; Spearman, 1927; Stern, 1912; Wechsler, 1939), is the most dominant approach to the study of intelligence because it is the most systematic. Along with having produced a substantial body of knowledge, the psychometric approach is the most widely used in practical settings (Neisser et al., 1996). Since the initial work of Alfred Binet and his assistant, Theophile Simon,

intelligence tests have been successfully used for many purposes such as selection, diagnosis, and evaluation.

Concepts of intelligence are attempts to clarify and organize a vast array of phenomena that include: “the ability to understand complex ideas, to adapt effectively to environments, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought” (Neisser et al., 1996). Even when experts in intelligence discuss the definition, “there appears more controversy than consensus” (Matthews et al., 2002). Two dozen prominent theorists were asked to define intelligence; two dozen different definitions were obtained (Sternberg & Detterman, 1986). Some theorists, notably Spearman, emphasized the importance of a general factor, *g*, in intelligence: “the constancy of total input shows that all mental activity, just like physical, consists of ever vary manifestations of one and the same underlying thing, to which may be given the name of energy” (Spearman, 1927). Vernon (1950) described an “all-round thinking capacity” or “mental efficiency”. Boring (1923) operationalized the definition with “intelligence is what intelligence tests test”. Wechsler (1958) defined intelligence as “the aggregate or global capacity of the individual to act purposely, to think rationally, and to deal effectively with his environment”. Matthews, Zeidner, and Roberts (2002) concluded that each definition contains flaws and as such, contributes to the controversies.

The study of intelligence, in particular the psychometric approach, has led to a substantial body of knowledge and has provided a “potent predictor” of success, yet, many questions remain unanswered (Mayer, Salovey, & Caruso, 2000). Mayer, Salovey, and Caruso commented that the conceptualization of intelligence as abstract

thinking demonstrates to predict academic success but, is far from being perfect, “leaving the vast amount of variance unexplained” (2000, p. 399).

In 1995, the American Psychological Association Board of Scientific Affairs established a Task Force to address issues concerning the study of intelligence that had been stirred by the narrow and pessimistic view presented in *The Bell Curve* (Herrnstein & Murray, 1994) and one of the conclusions was as follows:

It is widely agreed that standardized tests do not sample all forms of intelligence. Obvious examples include creativity, wisdom, practical sense, and social sensitivity; there are surely others. Despite the importance of these abilities we know very little about them: how they develop, what factors influence that development, how they are related to more traditional measures (Neisser et al., 1996, p. 97).

2.1.2 Emotions

The genesis for the study of emotions can be attributed to when the human race began to search for the key to happiness, and as such, is entwined within philosophical, religious, psychological, and ethical debates throughout history. The science of emotion has been problematic and is impeded with the complexities of linking tangible realities to the elusive, subjective, and experiential nature of emotions (Matthews et al., 2002).

From the realm of psychology, Salovey and Mayer provided a definition of emotions as:

organized responses crossing boundaries of many psychological subsystems including physiological, cognitive, motivational, and experiential systems. Emotions typically arise in response to an event, either internal or external, that has a positively or negatively valenced meaning for an individual. Emotions can be distinguished from the closely related concept of mood in that emotions are shorter and generally more intense (1990, p. 186).

Throughout the history of the study of emotions in psychology, the general focus was at pathological and dysfunctional outcomes. Mayer (2000) suggested that it

was only in the recent time when psychologists began to investigate the relationship of emotions and thought in the context of functional relationships that the stage was set for the emergence of EI.

2.1.3 Intelligence and Emotions Converge

For centuries Western thought has situated reason and emotion at opposite ends of a paradigm. Matthews, Zeidner, and Roberts (2002) wrote that the “hybrid term ‘EI’, combining emotion and intelligence, could well be considered an oxymoron by some” and that the relationship between the two “has traditionally been viewed as one involving a conflict between two different psychological forces”. They illustrated this view with a quotation from Marcus Aurelius, a Roman emperor and Stoic in 160 A.D.:

Let no emotions of the flesh, be they of pain or of pleasure, affect the supreme and sovereign portion of the soul [i.e. reason]. See that it never becomes involved with them: it must limit itself to its own domain, and keep the feelings confined to their proper sphere. (Meditations, V, 26, as cited on p. 7)

Mayer (2001) examined the psychological activities of the past century and defined the emergence of EI into five time periods: Separate Narrow Fields, Precursors to EI, Emergence of EI, Popularization and Broadening of EI, and Research and Institutionalization of EI. It can be noted that the two concepts, emotions and intelligence, were contained in separate domains, and that the convergence of the two is a recent activity. Examination of the interaction did not begin until the 1970s. (See Mayer’s chapter for more detail on the history). Table 2.1 is a summary and adaptation of Mayer (2001) Table 1.1 (pp. 5-6).

Table 2.1 *Five Periods of Development in Emotions and Intelligence in Past Century*

1900-1969	Intelligence Research
<i>Intelligence and Emotions as Separate Narrow Fields</i>	<ul style="list-style-type: none"> -Psychometric approach to intelligence is developed and refined.
	Emotions Research
	<ul style="list-style-type: none"> -Debate which happens first: physiological reaction or emotion. -Movement from Darwin's theory for heritability and evolution of emotional responses to now being viewed as culturally determined. -Social Intelligence (Thorndike, 1920) as concept is introduced.
1970-1989	
<i>Precursors to EI</i>	<ul style="list-style-type: none"> -The field of cognition and affect emerged to examine how emotions interacted with thoughts. -Gardner (1983) theory of multiple intelligences described an intrapersonal intelligence and an interpersonal intelligence. -Empirical work on social intelligence developed four components: social skills, empathy skills, prosocial attitudes, and emotionality (sensitivity). -Brain research began to separate out connection between emotion and cognition. -Occasional use of EI appeared.
1990-1993	
<i>The Emergence of EI</i>	<ul style="list-style-type: none"> -Mayer and Salovey publish a series of articles on EI. -First ability measure of EI published. -Editor of the journal <i>Intelligence</i> argued for an existence of EI. -Further developments for EI in the brain sciences.
1994-1997	
<i>The Popularization and Broadening</i>	<ul style="list-style-type: none"> -Goleman (1995) publishes <i>Emotional Intelligence</i> which becomes worldwide best-seller. -<i>Time</i> magazine used the term "EQ" on its cover (Gibbs, 1995, October 2). -measures of EI using mixed model theories were published.
1998-Present	
<i>Research on the Institutionalization of EI</i>	<ul style="list-style-type: none"> -refinements to the concept of EI. -new measures of EI introduced. -appearance of peer-reviewed articles on the subject.

As research in the areas of emotions and intelligence abounded, a need to unify research in the areas of physiological, developmental, cognitive, linguistic, and socially oriented findings seemed to point towards the unifying of the two underlying

frameworks developed within the fields of emotions and intelligence. Salovey and Pizarro (2003) indicate that “the emotional intelligence was introduced, in part, as a response to this growing but scattered body of research findings” (p. 266).

2.1.4 Models of EI

Two distinct conceptualizations of EI currently mark the frameworks for empirical and psychometric research. Matthews, Zeidner, and Roberts described them as “EI-as-ability and EI-as-personality” (2002, p. 517). Mayer, Salovey and Caruso argued for EI as a type of mental ability and indicated that their ability model focuses on the “interplay of emotion and intelligence as traditionally defined”, whereas the EI-as-personality conceptualization is considered a mixed model, “which describe[s] a compound conception of intelligence that includes mental abilities, and other dispositions and traits” (2000, p. 399). Table 2.2 provides a comparison of the two primary conceptualizations of EI, the ability model (Mayer & Salovey, 1997) to the mixed model (Bar-On, 1997, 2002).

Table 2.2 *Comparison of the EI Ability Model with EI Personality Model*

<i>Mayer & Salovey (1997)</i>	<i>Bar-On (1997, 2002)</i>
Overall Definition	Overall Definition
“Emotional intelligence is the ability to perceive and express emotion, assimilate emotion in thought, understand and reason with emotion, and regulate emotion in the self and others” (Mayer & Salovey, 1997)	“Emotional intelligence is a multi-factorial array of emotional and social competencies that determine how effectively we relate with ourselves and others and cope with daily demands and pressures” (Bar-On, 2002).
Theoretical Components	Theoretical Components
Four Branches:	Five Factors and subcomponents:
1.Perception and Expression of Emotion	1. Intrapersonal (self-awareness and self-expression):
2. Assimilating emotion in Thought	2.Interpersonal (social awareness and interpersonal relationship):
3. Understanding and Analyzing Emotion	3.Stress Management (emotional management and regulation):
4.Reflective Regulation of Emotion	4.Adaptability (change management):
	5.General Mood
Measurement Type	Measurement Type
Performance-based	Self-Report
Model Type	Model Type
Ability	Mixed

Mayer, Salovey, and Caruso (2000) described the ability model of EI as mostly a unitary concept, subdivisible into four levels of branches. It begins with the first branch, perception and expression of emotion, which involves identifying and expressing emotions in one’s self and in other people. The second branch, assimilating emotion in thought, involves using emotions to improve thought. Branch three, understanding and analyzing emotion, involves using thought to process emotions. The final branch, reflective regulation of emotion, concerns emotional self management and

management of emotions in other people. According to this model, EI begins with the first branch since “only if one has good emotional perception in the first place can one make use of mood changes and understand emotions. And only with such understanding will one have the breadth of knowledge necessary to manage and cope with feelings fully” (Mayer, 2000, p. 110). See Figure 2.1 for an illustration of the Mayer and Salovey (1997) ability model.

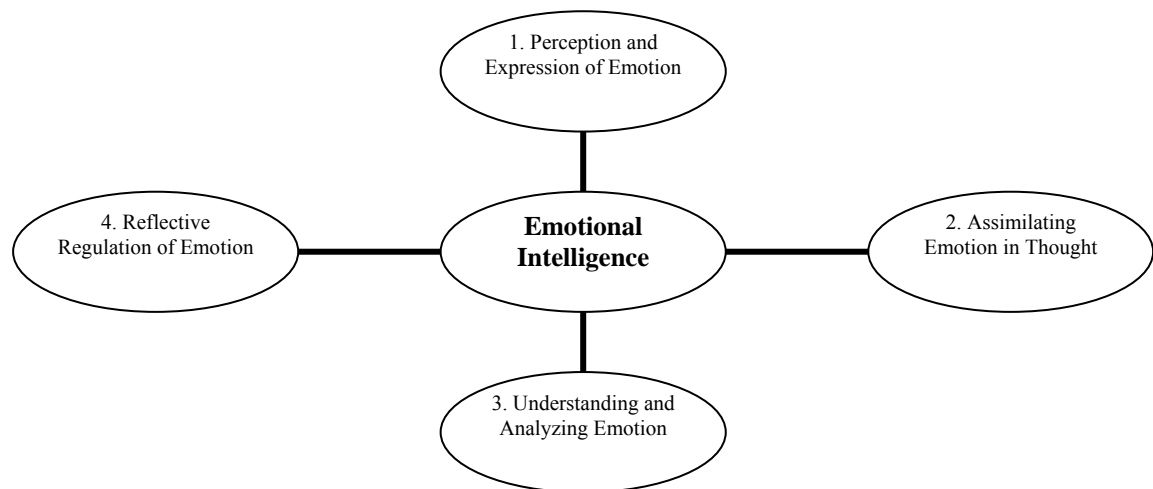


Figure 2.1 Mayer & Salovey (1997) EI Ability Model

EI-as-personality models “appear to invoke clusters of established personality traits” (Matthews et al., 2002, p. 15). Bar-On (1997, 2002) presented a mixed model conceptualization of EI with a hierarchal structure as illustrated in Figure 2.2. The BarOn EQ-i (Bar-On, 1997) was one of the first validated instruments in the market, operationalizing the conceptualization with an overall composite factor that consists of five major components. Each component is then comprised of a number of sub-components:

1. Intrapersonal (self-awareness and self-expression):

- Self-Regard is the ability to be aware of, understand, and accept one’s self.

- Emotional Self-Awareness is the ability to be aware of and understand one's emotions.
- Assertiveness is the ability to express feelings, beliefs, and thoughts and defend one's rights in a non-destructive manner.
- Independence is the ability to be self-reliant and to be free of emotional dependency on others.
- Self-Actualization pertains to the ability and drive to set and achieve one's goals.

2. Interpersonal (social awareness and interpersonal relationship):

- Empathy is the ability to be aware of and to understand the feelings of others.
- Social Responsibility is the ability to identify with and feel part of one's social group.
- Interpersonal Relationship involves the ability to establish mutually satisfying relationships with others.

3. Stress Management (emotional management and regulation):

- Stress Tolerance is the ability to effectively and constructively manage one's emotions.
- Impulse Control is the ability to effectively and constructively control one's emotions.

4. Adaptability (change management):

- Reality Testing is the ability to validate one's feelings and thinking with external reality.
- Flexibility is the ability to cope and adapt to change in one's daily life.

- Problem Solving is the ability to generate effective solutions to problems of a personal and social nature.

5. General Mood

- Optimism is the ability to have a positive outlook and look at the brighter side of life.
- Happiness is the ability to feel content with one's self, others, and life in general.

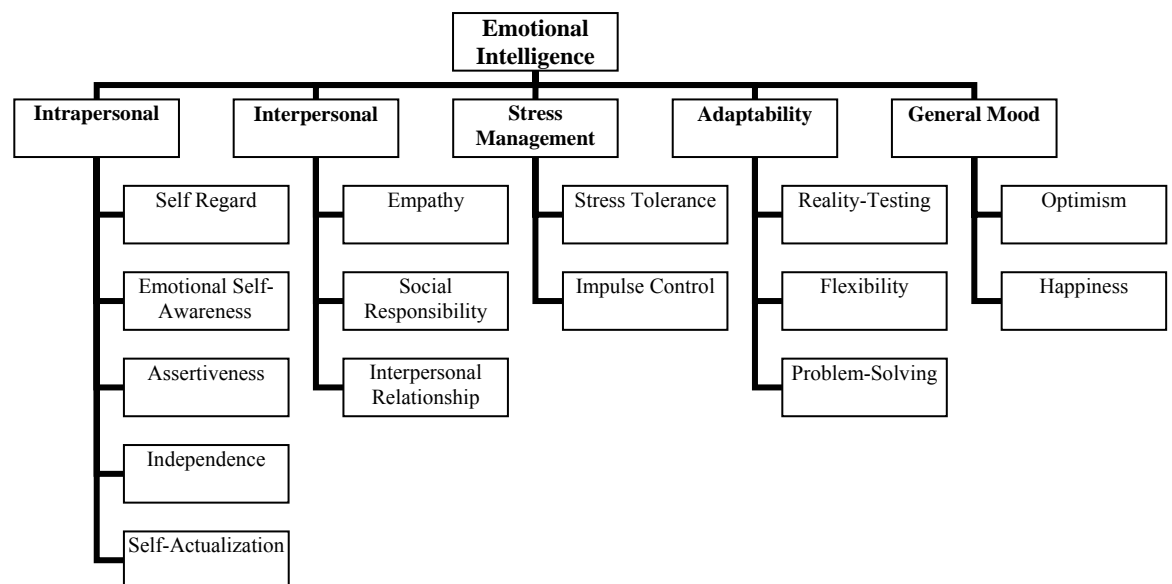


Figure 2.2 Bar-On (1997) Mixed Hierarchical EI Personality Model

2.1.5 Issues

Problems and shortcomings plague the theoretical and empirical development of EI. Two issues of primary concern are the lack of consensus of what defines EI and the overlap with already existing constructs which suggests a redundancy of constructs.

Studies comparing the two primary conceptualizations of EI have provided results with low correlations. The *BarOn Emotional Quotient Inventory: Short Technical Manual* (BarOn EQ-i:S; Bar-On, 2002) refers to Sitarenios' (1999)

comparison of the BarOn EQ-i:S and the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT, Mayer, Salovey, & Caruso, 1999). It reported low correlations with the Composite EI and ranged from .26 to .40 on the Facilitation scale and Emotion Management, respectively. The correlation of the Composite EI to the Total MSCEIT scale was low ($r = .36$).

On the other hand, Parker (2001) correlated the BarOn EQ-i:S with the NEO-Five Factor Inventory (NEO-FFI, Costa & McCrae, 1992), a self-report measure assessing personality dimensions related to the five-factor model of personality. He found moderate correlations with the Composite EI on four of the five dimensions: $r = -.53$ with Neuroticism (men), .43 with Extraversion (women), .43 with Agreeableness (men), and .46 with Conscientiousness (both women and men).

Within the EI-as-personality models, there is lack of consensus as to which list of attributes should be considered in the conceptualization of EI. Mayer, Salovey, and Caruso wrote that “because use of the term is no longer constrained by the meanings of the terms emotion or intelligence, it is difficult to decide what list of traits belongs with the term. Such difficulty is becoming more evident as [EI-as personality] models increasingly diverge from each other.”(2000, p. 112).

Amid the concerns surrounding the construct of EI, the scientific community remains interested with encouragement to proceed cautiously and responsibly with research. Matthews, Zeidner, and Roberts wrote:

EI may be the most protean of all known constructs. Thus construed research promoting EI may build a virtual Tower of Babel. Nevertheless, EI remains a viable field of scientific study and several researchers have attempted to develop validated tests for assessment of EI” (2002, p. 9).

2.1.6 Studies Linking EI with Health

Health is an area where EI² is showing potential to make a contribution to theoretical and applied research. Recently, there has been a heightened interest in the associations of EI with health behaviours (Austin, Saklofske, & Egan, 2005; Austin et al., in preparation).

Previous studies have shown that high EI is associated with positive health behaviours and vice versa, low EI is associated with negative health behaviours. Individuals with higher EI were more likely to experience better health and well-being (Slaski & Cartwright, 2002; Yates, 1999), more likely to seek help and follow advice of health professionals (Ciarrochi & Deane, 2001), and more likely to resist pressure in connection with risky health behaviour such as smoking (Trinidad & Johnson, 2002). Psychological emotions detrimental to health, such as distress and depression, have been found to be negatively correlated with EI (Dawda & Hart, 2000; Slaski & Cartwright, 2002).

More specifically, high EI has been shown to be associated with individuals who engage in regular physical exercise. In a recent study, using the Emotional Intelligence Scale (Schutte et al., 1998), Davidson (2004) found a group that reported to be exercisers had significantly higher EI than a group that reported to not exercise, ($M = 123.55$ and 117.97 , respectively, $t(337) = -2.15$, $p < .05$).

² This section of the literature review examines studies that involve EI in general with health behaviour; no specific conceptualization is targeted.

2.2 Health Behaviour and Exercise

Physical benefits of exercise have been well documented (Bouchard, Shepard, & Stephens, 1994). The Public Health Agency of Canada's Physical Activity Unit indicate that "scientific research strongly supports the role of physical activity in disease prevention and in the treatment of chronic disabling conditions" and "regular physical activity reduces the risk of high blood pressure, stroke, and coronary heart disease - the latter by as much as 50 percent" (Physical Activity Unit, 2003, Preventing Disease, ¶ 1). According to the 2000/01 Canadian Community Health Survey, a majority of adult Canadians (56 percent) are inactive (Craig & Cameron, 2004).

Contributions from the domain of psychology has provided important information to the understanding of health behaviour. In an extensive examination of health behaviour and health education, Glanz, Rimer, and Lewis wrote that "psychology brings to health education a rich legacy of over a hundred years of research and practice on individual differences, motivation, learning, persuasion, and attitude and behaviour change" (2002, p. 4). A recent study has shown that negative exercise attitudes is one of the psychological barriers to exercise among sedentary people (O'Connor, Rousseau, & Maki, 2004).

2.2.1 Models

When specifically focusing on changing behaviour to healthy levels of exercise, a complexity of social, psychological, and environmental factors are intertwined. Models of health behaviour provide possible frameworks from which to proceed. Five levels of factors have been identified as influencing health-related behaviours and conditions: (1) intrapersonal or individual factors, (2) interpersonal factors,

(3) institutional or organizational factors, (4) community factors, and (5) public policy factors (McLeroy, Bibeau, Steckler, & Glanz, 1988). When researchers want to examine the intrapersonal level, four predominant and well-developed theories and models stand out: Health Belief Model (HBM), the Theory of Reasoned Action (TRA, Ajzen & Fishbein, 1980), the Theory of Planned Behaviour (TPB), the Transtheoretical Model (TTM) or Stages of Change (SOC, Prochaska, Redding, & Evers, 1996), and the Precaution Adoption Process Model (Weinstein, 1988) (PAPM). The theories have much in common, can be used for design interventions, and have their respective strengths and weaknesses that need further development (Rimer, 2002). This study will implement the constructs from the Health Belief Model (HBM), one of the most widely used models to understand health behaviour.

While the HBM (Hochbaum, 1958) framework has evolved since its beginnings, it is based particularly on the work of Lewin (1935) and the “phenomenologic orientation to positive and negative influences in the individual's subjective world as they affect behaviour” (Poss, 2001). As such the HBM framework is particularly useful when the individual's primary motivation to take on positive health action is the desire to avoid negative health consequences. See an illustration of the model in Figure 2.3.

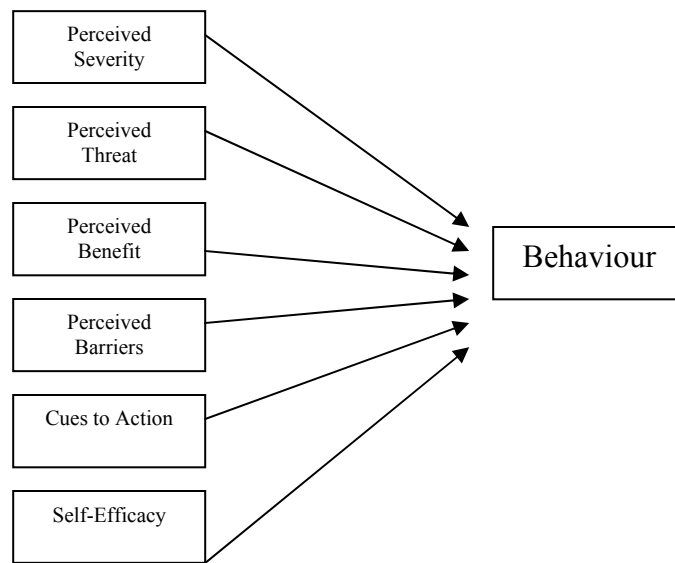


Figure 2.3 Health Belief Model. Adapted (Becker & Maiman, 1975)

While the model has undergone some modifications its original form, it is commonly described by the following four constructs³ (Redding, Rossi, Rossi, Velicer, & Prochaska, 2000):

1. Perceived severity: the belief that a health problem is serious. This refers to the beliefs a person holds concerning the effects a given disease or condition would have on one's state of affairs. These effects can be considered from the point of view of the difficulties that a disease would create.
2. Perceived threat: the belief that one is susceptible to the problem. Individuals vary widely in their perception of susceptibility to a disease or condition. Those at low end of the extreme deny the possibility of contracting an adverse condition. Individuals in a moderate category admit to a statistical possibility of

³ The descriptions are taken from Brown (1999)

disease susceptibility. Those individuals at the high extreme of susceptibility feel there is real danger that they will experience an adverse condition or contract a given disease. For instance, pain and discomfort, loss of work time, financial burdens, difficulties with family or relationships, and susceptibility to future conditions. It is also important to include emotional and financial burdens when considering the seriousness of a disease or condition.

3. Perceived benefit: the belief that changing one's behaviour will reduce the threat of the condition. Taking action toward the prevention of disease or toward dealing with an illness is the next step to expect after an individual has accepted the susceptibility of a disease and recognized it is serious. The direction of action that a person chooses will be influenced by the beliefs regarding the action.
4. Perceived barriers: a perception of the obstacles to changing one's behaviour. However, action may not take place, even though an individual may believe that the benefits to taking action are effective. This lack of action may be due to barriers. Barriers relate to the characteristics of a treatment or preventive measure that may be inconvenient, expensive, unpleasant, painful or upsetting. These characteristics may lead a person away from taking the desired action.

Other factors that have been included in HBM are cues to action (internal or external stimuli that trigger action) and self-efficacy, the belief that one has the ability to change one's behaviour (Redding et al., 2000).

Kirscht (1988) wrote in his analysis of the HBM, it is "complex and variable in its history, yet surprisingly robust and useful" (1988, p. 38, as cited in Poss, 2001). The

model is “useful in explaining health behaviours, it is generalizable to a variety of settings, it is parsimonious, and because it is a middle-range theory, it can generate hypotheses for testing” (Poss, 2001; Health Belief Model, para. 10).

2.2.2 Issues Concerning HBM

While HBM has been used extensively since the 1950s to explain health behaviour and inform health education, there are concerns with how HBM is measured and analyzed (Janz, Champion, & Strecher, 2002; Rimer, 2002). Previous studies have neglected to establish the reliability and validity of their measures. Previous studies have also been inconsistent in addressing the relationships among the HBM components.

When using HBM as part of the research framework, Janz, Champion, and Strecher (2002) provided a number of recommendations and considerations including: (a) to test the HBM as a model, or as a combination of constructs, and not as a collection of weighted variables operating simultaneously; (b) to be cautious about aggregating items that measure benefits and barriers into scales; and (c) to examine the reliability and validity of the HBM measure for each study.

2.3 Sex Differences

2.3.1 Definition of Sex and Gender

To avoid confusion of the terminology between sex and gender, the following definitions were used as a guide to use of terms within this study:

Sex refers to the classification of living things, generally as male or female according to their reproductive organs and functions assigned by chromosomal complement.

Gender refers to a person’s self-representation as male or female, or how the person is responded to by social institutions based on the individual’s gender

presentation. Gender is rooted in biology and shaped by environment and experience (Institute of Medicine, 2001, p. 1).

2.3.2 Sex Differences and EI

For the norming and development of the BarOn EQ-i:S measurement of EI, sex differences were examined within four age groups. While a significant main effect was found between age groups, there were no significant differences in Composite EI scores between the sexes.

2.3.3 Sex Differences and Health Attitude

There is a paucity of empirical studies into the women's health attitudes and health, in general. The inclusion of women in clinical studies was a policy issue addressed in a 2003 report for the Institute of Gender and Health (IGH) in the Canadian Institute for Health Research , emphasizing that "while women were not being systematically excluded from studies, they were not systematically included and were, in fact, excluded from several landmark studies that affected public health practice" (Pinn, 1994; as cited in IGH, 2003, Policy on including women in clinical studies).

In addition to the need for empirical studies to include women in the study of health, the U. S. Institute of Medicine (2001) suggested that there are sex differences in health behaviour and perceptions: that "basic genetic and physiological differences, in combination with environmental factors, result in behavioural and cognitive differences between males and females" (p. 4). They indicated that sex is an important variable that affects health and illness throughout the life span.

With regards to exercise behaviour, there is evidence of sex differences. A recent study that examined genetic and common environmental factors of female and

male twins from the ages of 16 to 20 years concluded that there was a main effect for sex and age; males participated more than females and, after 18 years of age, genetics was a primary factor of individual differences in sports participation (Stubbe, Boomsma, & De Geus, 2005). Denton, Prus, and Walters (2004) found gender differences in health due to psychosocial and behavioural determinants. Upon the investigation of trends within Canada, Craig and Cameron (2004) indicated that while active people are more likely to have stronger beliefs of the benefits of physical activity, women were more likely to have stronger beliefs than men particularly for the alleviation of stress. The same study also indicated that men are more physically active than women.

2.4 Self-Report Measurement

Measurement approaches vary, depending on the conceptualization of the construct and the purpose of the measurement. EI-as-ability measurements tend to be performance assessments as this conceptualization focuses more on tasks and processes, similar to the psychometric approach to the study of intelligence. Self-report measures are employed for EI-as-personality conceptualizations, following the approach that is traditional and robust in the study of personality. The advantages to self-report methods are the efficiency and ease of administering and scoring the questionnaire. As such there are a plethora of self-report EI tests on the market; however, the ideal test is one that has undergone an extensive empirical development to satisfy validity in the four criteria: reliability, content validity, predictive validity, and construct validity (Matthews et al., 2002).

Self-report measures request participants to rate a series of descriptive items – statements or adjectives. The rating is most often conducted using a Likert-type, usually with five response options, ranging from “Most definitely disagree” to “Most definitely agree”. This scale type of measurement relies on the participant’s understanding, perceptions, and honesty. As such, the response may not represent the actual ability or trait of the respondent. In addition, one of the characteristics of self-report measures include susceptibility to response bias, a phenomenon when people distort their responses in order to appear better or worse than they actually are (Matthews et al., 2002). In order to reduce this weakness, self-report designers build in validity indexes to measure distortion (Bar-On, 1997).

Although self-beliefs are important, some researchers, particularly those that focus on EI-as-ability, question whether those self-beliefs tap into facets of EI. Mayer, Caruso, and Salovey (2000); and Ciarrochi, Deane, and Anderson (2002) found self-reported emotion perception is unrelated to how people actually perform in recognizing emotions.

2.5 Summary

In this chapter, the primary purpose was to review the construct of EI, health attitudes to exercise, sex differences in health, and the self-report measurement as they pertain to this study.

While the society at large has enthusiastically received the construct of EI, the scientific community has reservations. Lack of consensus of the definition of EI and overlap with already existing constructs which suggests a redundancy of constructs are the two major issues that threaten the theoretical development of the EI construct. It was

determined that there is a need to further provide empirical evidence for validity of the EI construct.

Health behaviour toward exercise was demonstrated to be a need for further study as well as an area where EI shows some potential to make a contribution to theoretical and empirical developments (Austin et al., 2005). The health belief model was shown to be able to provide a framework for examining the association of exercise attitudes with EI.

In addition, the review points to literature that supports the study of sex differences in studies of health, suggesting that males and females do differ in health behaviour and perceptions.

Finally, the self-report measurement was reviewed because this study focuses on the EI-as-personality conceptualization that uses the self-report method. Validity issues of self-report methods were taken into consideration for this study.

CHAPTER 3: METHODOLOGY

This chapter contains a description of the methodology conducted for this study. A non-experimental survey approach was used to investigate the relationship of EI with exercise behaviour within convenience samples of undergraduate students from a western Canadian university.

3.1 Method and Design

Within a non-experimental design, participants were not randomly selected but rather a sample of convenience was chosen, due to time constraints and “better designs were not feasible” (Campbell & Stanley, 1963). This study relied on voluntary participants, following the cooperation of professors for entry into their classes. While aspects of validity are threatened due to the non-random selection of participants, attempts were made to minimize the invalidating effects: (a) a large number of participants represented each subsample, (b) completion of the study in as close a time frame as possible, (c) protocol used to ensure the administration of the questionnaires was similar and to monitor the time it took to complete the questionnaire.

3.2 Participants

Adult participants in a western Canadian university setting were asked to volunteer to complete the questionnaire. The participants were informed that

participation was voluntary and they were asked to sign two consent forms that provided information of the study: one consent form remained with them and the second was kept in a place separate from the questionnaires in order to secure anonymity for the questionnaire.

A total of 538 participants from a western Canadian university completed the questionnaire (response rate = 74%). Of these participants, the data of 398 individuals who met all inclusionary criteria were analyzed. The inclusionary criteria applied were in compliance with valid data within the target population: (a) registered in an undergraduate program, (b) equal to or younger than 29 years of age, (c) more than 80% of items completed for each scale, (d) had an EI Inconsistency Score less than 12, and (e) had an EI Positive scale *z*-score within two standard deviations from the mean.

For this study, participants were omitted from this study for the following reasons: (a) 81 participants were over the age of 29 years, (b) 4 participants failed to respond to program demographic items, (c) 27 participants were not undergraduates, (d) 20 participants were two standard deviations above or below the Positive Impression mean, (e) seven participants scored 12 or higher on the Inconsistency scale, and (f) one participant failed to respond to more than 40% of the items on a number of scales.

3.3 The Questionnaire

3.3.1 *EI Measure*

The BarOn Emotional Quotient Inventory: Short (BarOn EQ-i:S) is a shortened version of the BarOn Emotional Quotient Inventory (BarOn EQ-i; Bar-On, 1997) and is used when the more detailed assessment is not required or not possible. The BarOn EQ-i:S is a self-report measure of EI, designed for individuals who are 16 years of age or

older and who are able to respond honestly and willingly. The administration time to complete this section of the questionnaire was approximately ten minutes. Although there were no imposed time limits, respondents were to complete the measure in one sitting and at a steady pace.

Readability was determined to be equivalent to a North American 4th-grade reading level after applying the Dale-Chall Formula (Chall & Dale, 1995; Dale & Chall, 1948), a formula based on average number of words per sentence and the percentage of words that do not appear on the 3000 word list.

The inventory consisted of 51 items, employing a five-point Likert response scale with the following descriptors: “1=Very seldom or not true of me”, “2=Seldom true of me”, “3=Sometimes true of me”, “4=Often true of me”, “5=Very often true of me or true of me”. The measure yielded two validity scale scores, one total EQ score, and five EQ composite scale scores, and it subsequently allowed for different levels of interpretation.

The two validity scale scores assessed the degree the results were a valid representation of the respondents’ feelings, thinking, and behaviour. The Inconsistency Index measured response inconsistency and was an indication of random responding. An Inconsistency Index score of 12 or greater was examined cautiously. The Positive Impression scale, designed to detect an exaggerated positive impression (“faking good”), was recognized by scores two standard deviations above the mean; and vice versa, scores that were two standard deviations below the mean suggest “faking bad”.

The EI Composite scale claims to assess an overall level of EI and present a “snapshot” of a respondent’s present emotional well being. It is composed of and

determined by the summation of the five factor scales: Intrapersonal, Interpersonal, Adaptability, Stress Management, and General Mood. While the factors can be examined individually along with the composite scale, this study focused on the Composite EI scale based on evidence for the unidimensionality of the measure (Petrides & Furnham, 2001).

The BarOn EQ-i:S scale development was originally based on a random sample (N = 2000) selected from the population sample used in norming the BarOn EQ-i (Bar-On, 1997). The developer conducted reliability and validity analyses along with the already extensive analyses in the development of the parent measure. That process was indicative of a major emphasis on the part of the developer to obtain a reliable and valid measure.

3.3.2 Exercise Attitude Measure

The Health Belief Questionnaire (HBQ; Austin, unpublished) was developed from the framework of the Health Belief Model (HBM) and extended to capture attitudes to exercise. The questionnaire asked participants to agree or disagree with items that asked for their feelings about taking exercise and about some of the health problems that have been associated with not taking sufficient exercise. Similar to the BarOn EQ-i:S, the administration time to complete this section of the questionnaire was approximately ten minutes.

The inventory consisted of 42 items, employing a five-point Likert response scale with the following descriptors: “1 = Strongly Disagree” to “5 = Strongly Agree”. The measure yields a self-reported activity level and four scale scores: (1) Perceived Susceptibility assesses beliefs of future health effects due to a lack of sufficient exercise,

(2) Perceived Severity assesses beliefs of the pervasiveness of illnesses related to insufficient exercise, (3) Perceived Health Benefits (HA Benefit) assesses beliefs of health benefits to regular exercise, and (4) Perceived Barriers assesses beliefs that prevent regular exercise. This study focused on the HA Benefit scale, following suggestion from the literature not to use a composite scale of all factors (Sheeran & Abraham, 1996).

To date, the psychometric properties and development of the HBQ have not been published. For this study, the internal consistency reliability and a validity analysis was conducted to provide evidence of validity for the inferences based on the HA Benefit scale scores.

3.4 Procedure and Data Collection

Professors were contacted to arrange for class time to administer the questionnaire to their students. After an introduction to the study, the class was invited to participate. After consent forms were signed, the questionnaires were distributed. The average total administration time was 45 minutes.

3.5 Data Verification

3.5.1 Data Verification

After all the data were entered, ten questionnaires were randomly selected and checked for every item entered. No errors were found, however, if an error was found then another ten questionnaires would have been randomly checked.

A frequency analysis was conducted to examine the maximum and minimum value for each variable. After all variables were checked and corrected, additional

analysis was conducted until all indicated the appropriate range of data. For example, the categorical variable for sex was coded “1” for Female and “2” for Male; therefore, any data for this variable that did not fall in the range of “1” and “2” would have been checked.

3.5.2 Missing Value Data

After legitimate missing values were coded 999, a missing value analysis was conducted using SPSS. One subject was found to have more than 40% of the items missing for the EI Composite scale and was excluded from the analysis.

After recoding reverse scoring items, scale scores were calculated for the validity indexes, EI factors, EI Composite, HA Benefit, and Self-reported Activity Level. The mean multiplied by the number of items in the scale was used to calculate the EI factor scores and HA Benefit to adjust for missing items, following the method described in the *BarOn EQ-i:S Technical Manual* (2002). See Appendix C for details and equations involved in computing scales.

3.5.3 Data Validation

The BarOn EQ-i:S (2002) measure provides two indexes that may be used to check the validity of the responses: Inconsistent Index and the Positive Impression Scale.

The Inconsistent Index provides “an estimation of how consistent the respondent was in responding to similar items” and “a score of 12 or greater indicates a random response pattern” (Bar-On, 2002, p. 15). For this study, seven subjects that had a score of 12 or more were omitted from the data analyses.

The Positive Impression Scale was designed to detect respondents who may be giving an exaggerated positive impression, indicated by a score greater than two standard deviations above the mean. In contrast, an exaggerated negative impression may be indicated by a score two standard deviations below the mean. For this study, 20 subjects that had a score two standard deviations above or below the mean were omitted from the analysis.

3.6 Data Analysis

All data analyses for this study were performed using SPSS Version 13 (SPSS, 2004). Both descriptive and inferential statistical procedures were completed. Descriptive statistics, including the means and standard deviations, were used to facilitate statistical interpretations. Pearson Product Moment correlation coefficients were calculated in order to identify any statistically significant relationships existing among EI (EI Composite), exercise attitude (HA Benefit), and self-reported activity level. Univariate analyses of variance (ANOVAs) and a multivariate of analysis (MANOVA) were employed in order to determine whether there were group differences occurring more frequently than would be attributable to chance.

Primarily, the purposes of the data analyses were to investigate the relationship between EI and exercise attitude through correlation analysis and the examination of groups differing in levels of exercise. This purpose followed the indication from Matthews, Roberts, and Ziedner (2004) of the paucity of empirical evidence to backup claims for the substantiation of the EI construct, and the indication from Austin, Saklofske, and Egan (2005) of the potentiality for EI to be associated with exercise behaviour.

Second, all data analyses, except for the MANOVA, included an examination of sex differences, following a recommendation within the literature review that sex differences should be examined in studies of health behaviour (Institute of Gender and Health, 2003). Regarding EI, Bar-On (2002) indicated that EI Composite does not differ significantly within age groups. This study did not expect to find sex differences because one age group was targeted. However, the literature indicated that sex differences occur in health behaviour, suggesting that this study may encounter sex differences in HA Benefit and exercise activity (Craig & Cameron, 2004). Therefore, while sex differences were expected in exercise attitudes, EI was hypothesized to correlate positively with HA Benefit for females and males.

The following is an overview of the topics and/or type of data analyses performed for this study:

1. Reliability Analyses of Measures
2. Validity Analyses of Measures
3. Descriptive Analysis of Sample and Subsamples
4. Correlation Analysis: EI Composite and HA Benefit
 - a. The research hypothesis was that EI Composite will correlate positively with HA Benefit for females, males, and overall.
Second, it was hypothesized that there will be sex differences.
5. General Linear Model Univariate Analyses (ANOVAs)
 - a. A validity check would find that the Kinesiology subsample did represent a group of a majority of high level exercisers and at a

higher level than the NonKinesiology group that consisted of a mixed group of exercisers. Sex differences would be investigated.

- b. The research hypothesis was that the Kinesiology subsample, a majority of high level exercisers, would have higher EI Composite mean than the NonKinesiology subsample, a mixed group of exercise levels. Second, it was hypothesized that no sex differences would be found.
- c. The research hypothesis was that the Kinesiology subsample, a majority of high level exercisers, would have higher HA Benefit mean than the NonKinesiology subsample, a mixed group of exercise levels. Second, it was hypothesized that sex differences would be found.

6. General Linear Model Multivariate Analysis (MANOVA)

- a. The research hypothesis was that the mean vector of HA Benefit and Self-reported activity level would be higher for the higher quartile EI Composite group than for the other EI Composite groups: the mid-range quartiles group and the lowest quartile group.

CHAPTER 4: RESULTS

The purpose of this chapter is to present the results of the data analyses conducted to examine the relationship between EI, as operationalized by EI Composite scale in the BarOn EQ-i:S measure, and exercise attitude, as operationalized by the HA Benefit scale in the HBQ measure. Second, this chapter includes the results of the data analyses conducted to examine for sex differences in EI and exercise attitude.

Four primary hypotheses were investigated:

1. The EI Composite scale and HA Benefit scale would be more correlated positively, than would be attributable to chance, in the sample and subsamples. Second, sex differences were hypothesized to occur; however, the correlations would be positive for both, females and males.
2. The mean EI Composite would be higher, than would be attributable to chance, for the subsample consisting of a majority of exercisers than for the group of mixed levels of exercise. Second, no sex differences than would be attributable to chance were hypothesized because all subsamples are within the age group of 18 to 29 years.
3. The mean HA Benefit would be higher, than would be attributable to chance, for a group consisting of a majority of exercisers than for the group of mixed levels of exercise. Second,

sex differences than would be attributable to chance were hypothesized to occur.

4. The mean vector of HA Benefit and Self-reported Activity Level was hypothesized to be higher, than would be attributable to chance, for the top quartile EI group than for the mean vector of the lowest quartile EI group.

4.1 Sample and Subsample Descriptive Statistics

The sample ($N = 398$) was predominantly female (72%) and had a mean age of 22 years ($SD = 2.5$) with a range from 18 to 29 years. The majority of the sample (68%) had indicated a NonKinesiology field of study.

In order to examine the sex and group differences of the EI Composite scale and the HA Benefits scale, the sample was further divided in the four subsamples: Female NonKinesiology ($n_1 = 209$), Female Kinesiology ($n_2 = 78$), Male NonKinesiology ($n_3 = 62$), and Male Kinesiology ($n_4 = 49$). The means and standard deviations for age, EI Composite, HA Benefit, and Self-reported Activity Level are presented for each subsample and total in Table 4.1.

Table 4.1 *Sample and Subsample Descriptive Statistics*

	Female		Male		Total		TOTAL
	NonKin ²	Kinesiology	NonKin ²	Kinesiology	NonKin ²	Kinesiology	
<i>n</i>	209	78	62	49	271	127	398
	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)	(<i>SD</i>)
Age (Years)	22.51	20.87	21.89	21.08	22.37	20.95	21.92
	(2.63)	(1.85)	(2.66)	(1.58)	(2.65)	(1.75)	(2.48)
Composite EI	35.43	35.00	33.88	34.53	35.07	34.82	34.99
	(3.31)	(3.42)	(3.63)	(3.73)	(3.44)	(3.53)	(3.47)
HA Benefit	33.49	42.26	34.53	41.44	33.73	41.94	36.35
	(11.28)	(7.29)	(8.45)	(6.15)	(10.70)	(6.86)	(10.37)
Activity Level¹	31.99	40.33	34.84	41.02	32.64	40.60	35.15
	(10.08)	(8.92)	(9.28)	(7.57)	(9.96)	(8.39)	(10.18)

¹ Self-reported Activity Level is multiplied by 10 to facilitate comparisons.

² NonKinesiology has been shortened to NonKin.

4.2 Reliability and Validity Analyses of Measures

The notion of reliability developed within classical test theory attempts to provide an indication of how consistent the scale score would be if the subject was to respond repeatedly to the items. Internal consistency reliability is used to assess the consistency of results within the same measure as well as the homogeneity of the items. Two internal consistency reliability estimates, Cronbach's alpha and mean inter-item correlations, were examined for this study and reported by sex.

In SPSS, Cronbach's alpha is a model of internal consistency reliability that is calculated using the average inter-item correlation. When a set of items may represent a unidimensional latent construct, Cronbach's alpha is high ($> .80$). On the other hand, a

low Cronbach's alpha ($< .40$) is an indication that data may have a multidimensional structure.

The mean inter-item correlation assesses the degree to which the items consistently measure the same construct. A magnitude above .3 is considered a strong indication that the items are measuring the same construct.

4.2.1 Internal Consistency Reliability of EI Composite Scale

The 51-item self-report BarOn EQ-i:S (BarOn 2002) instrument has been determined to have strong reliability. Reliability analyses of the Total EI in this present study yielded a Cronbach's alpha of .90 in the sex variable for both the female and male categories. The Cronbach's alpha coefficients for the subscales ranged from .73 to .83 for the females and from .79 to .82 for the males. The mean inter-item correlations for the subscales ranged from .21 to .36 for the females and from .29 to .34 for the males. The results are comparable to the psychometric properties of the normative data reported in the *BarOn EQ-i:S Technical Manual (2002)*. Table 4.2 provides a summary of the reliability coefficients and mean inter-item correlations, along with a comparison to the coefficients of the normative data.

4.2.2 Internal Consistency Reliability for HA Benefit Scale

Reliability for the 40-item self-report HBQ demonstrated to have high internal consistency for all items in the questionnaire and in particular, the 10-item HA Benefit subscale had an alpha coefficient of .88. The mean inter-item correlations of the subscale provide additional support for internal consistency of the HA Benefit subscale.

Psychometric properties of normative data for comparisons were not published to date.

A summary of the reliability estimates are included in Table 4.2.

Table 4.2 *Internal Reliability Estimates of Measures*

Scale	N items	<i>n</i>	Cronbach's Alpha ^a	<i>M</i> Inter-item Correlation ^a
Females				
Total EI	45	268	.90 (.92)	.17 (.22)
EI Composite	5	287	.71	.33
EI-Intrapersonal	10	281	.83 (.81)	.32 (.31)
EI-Interpersonal	10	283	.73 (.82)	.21 (.32)
EI-Stress Management	8	285	.80 (.82)	.33 (.38)
EI-Adaptability	7	285	.80 (.81)	.36 (.39)
EI- General Mood	10	281	.81 (.85)	.30 (.37)
HA Composite	40	270	.92	.22
HA Benefit	10	282	.93	.56
Males				
Total EI	45	103	.90 (.93)	.17 (.24)
EI Composite	5	111	.72	.34
EI-Intrapersonal	10	109	.81 (.83)	.30 (.34)
EI-Interpersonal	10	110	.80 (.84)	.29 (.36)
EI-Stress Management	8	110	.80 (.82)	.33 (.37)
EI-Adaptability	7	111	.79 (.77)	.34 (.33)
EI- General Mood	10	107	.82 (.81)	.32 (.30)
HA Composite	40	107	.89	.16
HA Benefit	10	108	.88	.43

^a Note: Comparison to normative reliability coefficient is in brackets.

4.2.3 Validity of EI Composite Scale

A correlation analysis was conducted to examine the relationship of the EI Composite Scale with the five EI subscales, in order to determine the validity of using the full scale measure in the data analyses for this study. The intercorrelations between the EI Composite scale and the EI subscales were all significantly correlated ($p < .01$), ranging from .53 to .83.

The *BarOn EQ-i:S Technical Manual (2002)* reports that the low to moderate intercorrelations support the multidimensionality of the measure. However, Petrides and Furnham (2001) examined the intercorrelations of the BarOn EQ-i and concluded that “it appears the second-order factors of the EQ-i constitute a redundant layer in the structure” and rather, provide “a single factor model with 15 variables as indicators of one broad latent variable (Full Scale trait EI)” (p. 436).

The high internal consistency and significant intercorrelation of the composite scale with the subscales provides strong support of the unidimensionality of BarOn EQ-i:S measure, along with evidence for validity to use the EI Composite Scale in further data analysis. Table 4.3 presents the intercorrelations of the EI composite and factor scales by sex, along with the comparative normative data intercorrelations from the *BarOn EQ-i:S Technical Manual (2002)*.

Table 4.3 *Intercorrelations of EI Scales*

EI Scale	Males					
	Intra	Inter	Stress	Adapt	Mood	EI Comp
Intrapersonal	-	.29**(.53)	.28**(.52)	.17 (.49)	.57**(.85)	.72**(.67)
Interpersonal	.42**(.39)	-	.27**(.44)	.33**(.49)	.48**(.77)	.67**(.51)
Stress Management	.21**(.33)	.29**(.32)	-	.31**(.32)	.46**(.74)	.67**(.45)
Adaptability	.27**(.44)	.30**(.44)	.23**(.41)	-	.22*(.69)	.53**(.51)
General Mood	.59**(.79)	.43**(.78)	.31**(.65)	.29**(.70)	-	.83**(.84)
EI Composite	.78**(.69)	.67**(.56)	.59**(.54)	.56**(.47)	.80**(.86)	-

Females

Note: Males are above the diagonal and Females are below.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Comparative normative data intercorrelations are in brackets.

4.2.4 Validity of HA Benefit Scale

Convergent validity is a type of construct validity that is used to assess the extent to which a particular instrument correlates with a measure of a related or relevant construct, as would be expected between self-reported exercise attitudes and self-reported exercise activity level.

The correlation coefficients between HA Benefit and self-reported activity level were moderate and significant, at an alpha level of less than 0.01, for females and males, .64 and .69 respectively. The correlation analysis conducted to examine the strength of relationship of the HA Benefit Scale with self-reported exercise activity level provides support for convergent validity.

4.3 Correlation Analysis Between EI Composite and HA Benefit

The investigation of the relationship between EI and exercise attitude was of primary interest to this study. EI has been operationalized and measured by as the EI

Composite scale and exercise attitude has been operationalized and measured by the HA Benefit scale. The Pearson product-moment correlation coefficient indicates the degree that two continuous variables are linearly related. The significance test is whether there is a linear relationship between the two variables in the population.

Correlation coefficients were calculated for the sample and the subsamples. A correlation analysis was conducted to determine the strength of relationship. Table 4.4 presents the results of the correlational analyses, while Figure 4.1 presents scatterplot illustrations of the relationships. The correlations between between the EI Composite and HA Benefit scales were significant ($p < .01$) for both Kinesiology and NonKinesiology male subsamples ($r = .38$ and $.36$, respectively) and not significant for both female groups. The overall correlation was significant, $r(392) = .125$, $p < .05$).

Table 4.4 *Pearson Product Moment Correlations for Composite EI and HA Benefit*

Sample Group	<i>r</i>	<i>p-value</i>
Female NonKinesiology	.11	.11
Female Kinesiology	.05	.70
Male NonKinesiology	.36**	.004
Male Kinesiology	.38**	.007
Non Kinesiology	.15*	.017
Kinesiology	.17	.058
Female	.07	.25
Male	.37**	.001
Overall	.13*	.013

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

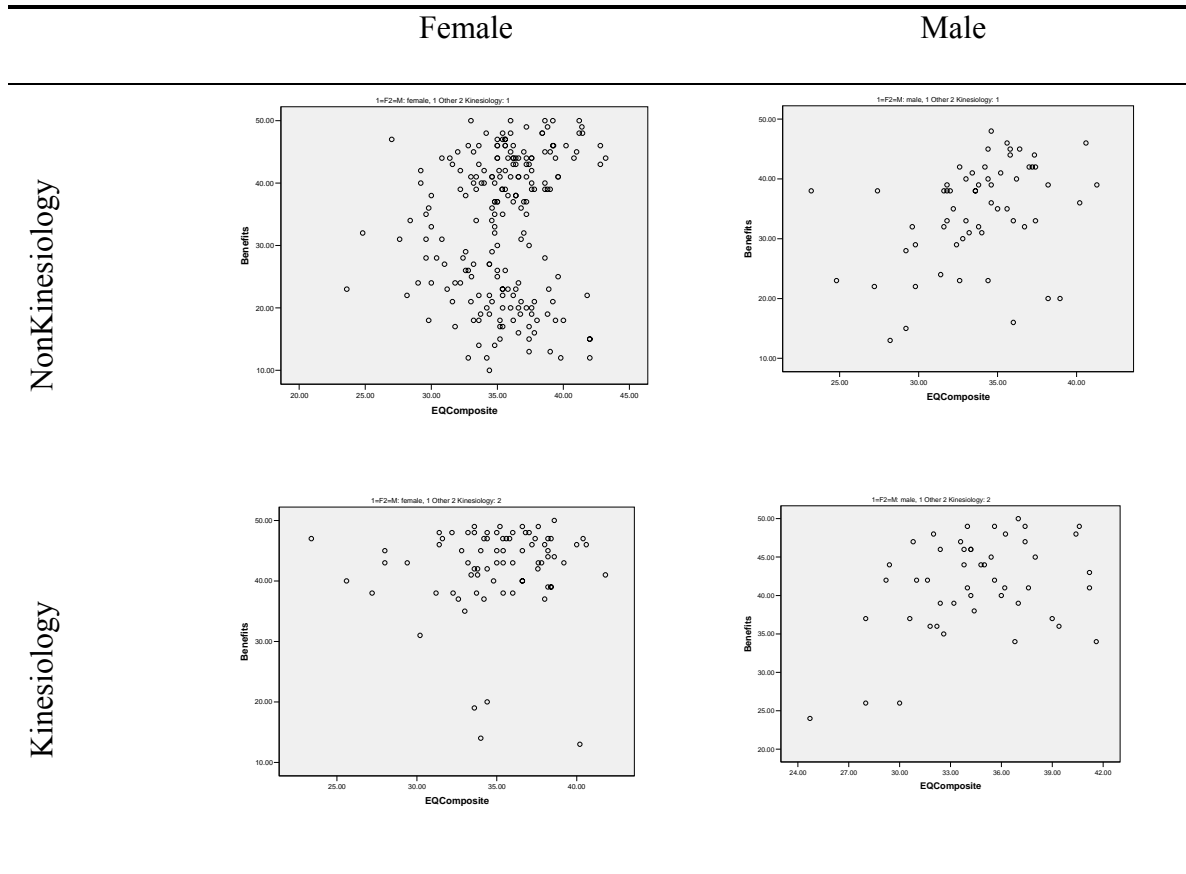


Figure 4.1 Subsample Scatterplots of Composite EI and HA Benefit Relationship

4.4 Univariate Analyses of Variance

The univariate analysis-of-variance (ANOVA) is a statistical procedure that was used to relate two between-subject factors to a dependent variable. The ANOVA F test is a statistical test that will evaluate whether the group means on the dependent variable differ significantly from each other. Partial eta square (Partial η^2) is more a measure of practical significance and is the ratio of ‘variation accounted by effect’ to sum of ‘variation accounted for by the effect and the variation left to error’. Larger values indicate greater amount of variation accounted for by the model effect. Three ANOVAs were conducted for this study to investigate further on the relationship of EI and exercise attitudes.

4.4.1 ANOVA Self-reported Activity Level

Self-reported activity level was a demographic variable that was used to describe the level of exercise within each subsample in order to identify whether the groups differed in exercise level. The self-reported activity level was the mean of two items rated on a Likert scale from “1 = strongly disagree” to “5 = strongly agree”, contributing to a score with a minimum of 1 and a maximum of 5.

The mean self-reported activity level was higher for the Kinesiology subsample (4.06) than for the NonKinesiology subsample (3.26). A 2×2 (field of study \times sex) between-subjects analysis of variance was conducted to evaluate the effect of field of study and sex on exercise activity level. Field of study was a main effect: the Kinesiology group had a significantly higher self-reported activity level, $F(1, 395) = 43.23$, $p < .005$, partial $\eta^2 = .10$. The main effect of the sex factor and the interaction effect of the field of study \times sex factors were not significant. Figure 4.2 illustrates the self-reported activity level for each group. Table 4.5 presents the self-reported activity level means and standard deviations for the subsamples and Table 4.6 presents the results of the ANOVA F -test.

The self-reported activity level ANOVA supported considerations for further data analyses conducted within this study. Primarily, the significant finding in the self-reported activity level ANOVA supported the assumption of that the Kinesiology subsample would consist of a majority of higher level exercisers and that the NonKinesiology subsample would self-report a wider diversity of exercise levels.

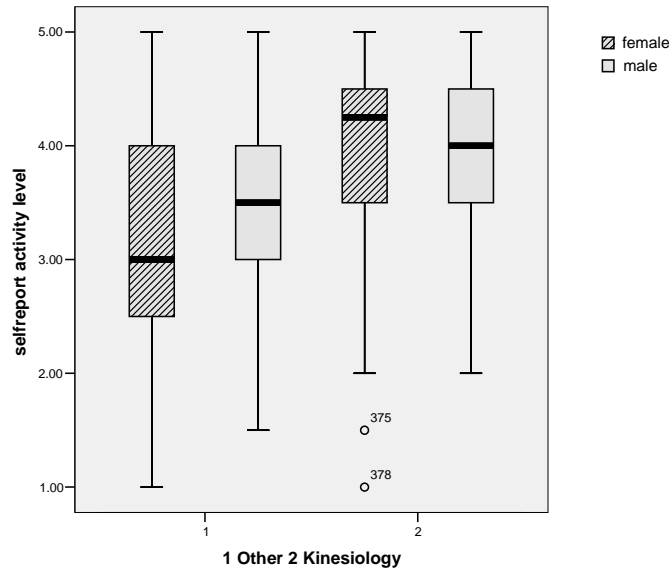


Figure 4.2 Boxplots of Subsample Self-reported Activity Level

Table 4.5 Subsample Self-reported Activity Level Descriptive Statistics

Subsample	<i>M</i>	<i>SD</i>
NonKinesiology Female	3.20	1.01
Non Kinesiology Male	3.48	0.93
Total NonKinesiology	3.26	1.00
Kinesiology Female	4.03	0.89
Kinesiology Male	4.10	0.76
Total Kinesiology	4.06	0.84
Total Female	3.42	1.04
Total Male	3.76	0.91
Total	3.52	1.02

Table 4.6 *Analysis of Variance for Self-reported Activity Level*

<i>Source</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>p</i>	<i>Partial η^2</i>
Field of Study	1	38.73	43.23	< .001	.10
Sex	1	2.31	2.57	.109	.007
Field of Study \times Sex	1	0.86	0.96	.328	.002
Error	392	0.90			

4.4.2 ANOVA EI Composite

A 2×2 (field of study \times sex) univariate ANOVA was used to investigate the effects of field of study and sex on the differences in EI as operationalized by the BarOn EQ-i:S Composite scale (EI Composite). The mean for the NonKinesiology subsample (35.07) was slightly higher than the Kinesiology subsample mean (34.82) while the mean for females (35.31) was higher than the mean for males (34.16). See Figure 4.3 for an illustration and Table 4.7 for detail of the EI Composite descriptive statistics.

The main effect of sex was significant, $F(1, 394) = 6.05, p = .012, \eta^2 = .019$; however, the effect size is trivial and the difference between the means is minimal. While there is a 95% chance that the difference of 1.15 would be expected if another sample was drawn from the population, the eta squared indicates that slightly more than 1% of the proportion of variance could be attributed to the sex factor.

The main effect for field of study and the field of study \times sex interaction effect were not significant, as shown in Table 4.8. The results of the analysis of variance for the EI Composite provided support for the similarity of the EI within all the subsamples.

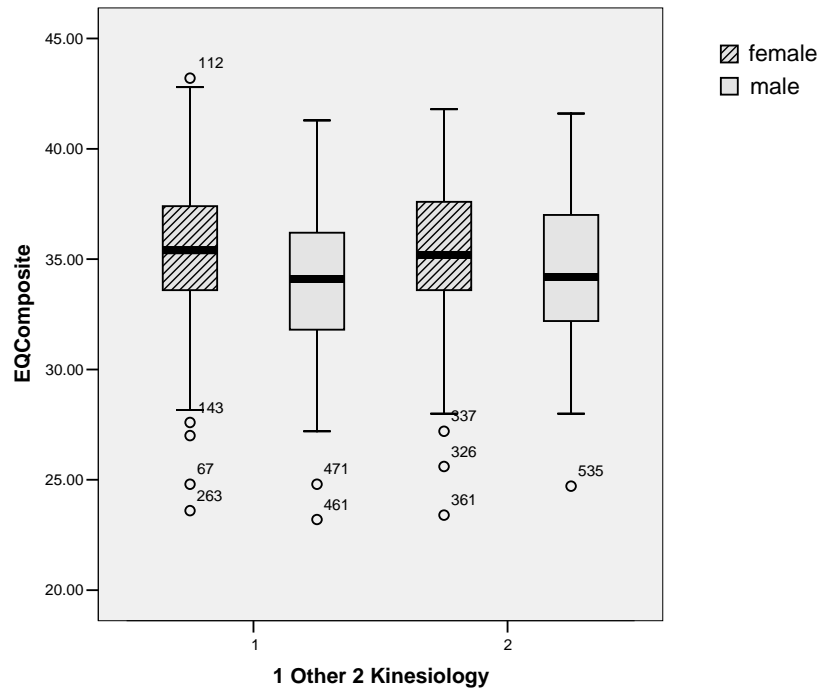


Figure 4.3 Boxplots of Subsample Total EI Composite

Table 4.7 Subsample EI Composite Descriptive Statistics

Subsample	<i>M</i>	<i>SD</i>
NonKinesiology Female	35.43	3.31
NonKinesiology Male	33.88	3.63
NonKinesiology Total	35.07	3.44
Kinesiology Female	35.00	3.42
Kinesiology Male	34.53	3.73
Kinesiology Total	34.82	3.53
Total Female	35.31	3.34
Total Male	34.16	3.67
Total	34.99	3.47

Table 4.8 *Analysis of Variance for EI Composite*

<i>Source</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>p</i>	<i>Partial η^2</i>
Field of Study	1	0.89	0.08	.78	< .001
Sex	1	75.61	6.41	.012	.016
Field of Study \times Sex	1	21.53	1.82	.18	.005
Error	394	11.80			

4.4.3 ANOVA Exercise Attitudes

A 2×2 (field of study \times sex) ANOVA was conducted to evaluate the effects of field of study and sex on attitudes to the benefits of exercise as operationalized in the HA Benefits scale in the HBQ. The HA Benefits scale consists of the mean of 10 items, with a possible score of a minimum of 10 and a maximum of 50.

The mean HA Benefit for the Kinesiology field of study ($M = 41.94$, $SD = 6.86$) was much higher than for the NonKinesiology field of study ($M = 33.73$, $SD = 10.70$). The means and standard deviations for HA Benefit for the subsamples are presented in Table 4.9 and illustrated in Figure 4.4.

The ANOVA indicated a main effect for field of study on HA Benefits, $F(1, 391) = 47.54$, $p < .001$, $\eta^2 = .11$, but no significant interaction effect between field of study and sex, or a main effect of sex. See Table 4.10. The field of study main effect indicated that the undergraduates in the Kinesiology field of study tend to have stronger attitudes to the benefits of exercise than the undergraduate students in the NonKinesiology fields of study.

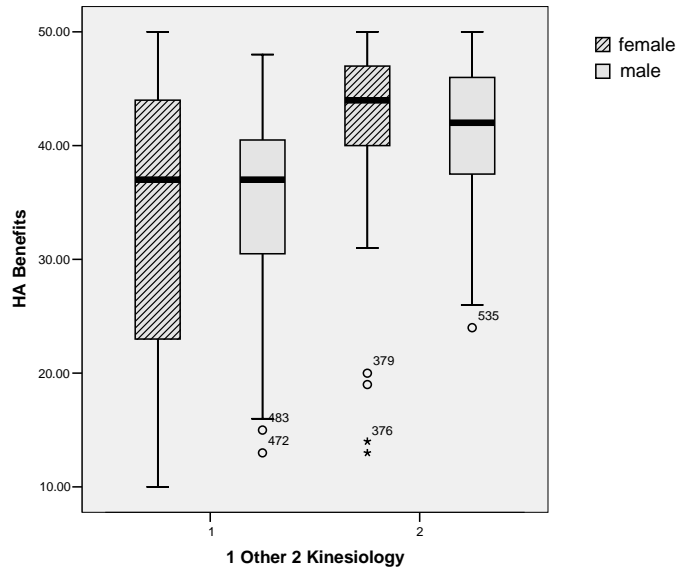


Figure 4.4 Boxplots of Subsample HA Benefits

Table 4.9 Subsample HA Benefits Descriptive Statistics

Subsample	<i>M</i>	<i>SD</i>
NonKinesiology Female	33.49	11.28
NonKinesiology Male	34.53	8.45
NonKinesiology Total	33.73	10.70
Kinesiology Female	42.26	7.29
Kinesiology Male	41.44	6.15
Kinesiology Total	41.94	6.86
Total Female	35.87	11.05
Total Male	37.60	8.24
Total	36.35	10.37

Table 4.10 *Analysis of Variance for HA Benefit*

<i>Source</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>p</i>	<i>Partial η^2</i>
Field of Study	1	4439.52	47.54	< .001	.11
Sex	1	0.86	0.01	.92	< .005
Field of Study \times Sex	1	62.73	0.67	.41	< .005
Error	388	93.39			

4.5 Multivariate Analysis of Variance

Multiple analysis of variance (MANOVA) is used to investigate main and interaction effects of categorical variables on multiple dependent interval variables. MANOVA uses one or more categorical independent variables as the ANOVA, but unlike ANOVA, there is more than one dependent variable. The MANOVA tests the differences in the centroids or mean vectors of the multiple interval dependents, while the ANOVA tests for the differences in means of the dependent variable.

In MANOVAs, no single test can be constructed that is optimal in all situations, resulting in the provision of a number of test statistics. Pillai's trace, Wilk's Lambda, Hotelling's trace, and Roy's Largest Root are provided in SPSS version 13.. The values range from 0 to 1; and decreasing values of Wilk's Lambda contribute more to the model, whereas increasing values of the other three methods contribute more to the model. Planned comparison or post hoc comparisons are performed to see which values of a factor contribute most to the explanation of the dependents.

4.5.1 MANOVA for EI Composite Subsamples

A one-way between-subject multivariate analysis of variance was conducted in order to test the hypothesis that the population mean vector for scores on exercise attitudes and level of exercise activity was higher for a group with higher EI scores.

Due to no significant differences of the sex variable determined in the ANOVA of self-reported activity level (see Table 4.6) and ANOVA of HA Benefit (see Table 4.10), the sample was analyzed in total for the MANOVA. The EI Composite scale score was formed into a categorical independent variable: Category 1 = Lowest quartile of scores, Category 2 = Middle two quartiles of scores, and Category 3 = Top quartile of scores. Table 4.11 contains the descriptive statistics of the EI Composite categories on the two dependent variables used in the MANOVA, along with the EI Composite means and standard deviations. Figure 4.5 illustrates the distribution of the EI Composite categories on the three variables.

The MANOVA statistical tests indicated a significant difference in the EI Composite categories within the dependent variables (Wilk's $\Lambda = 0.97$, $F(4, 772) = 3.21$, $p = .013$), but little practical significance as the partial η^2 is very weak (.016). In addition, Pillai's trace was small and equal to Hotelling's trace, further indicating that the effect did not contribute much to the model.

Hotelling's trace was equal to Roy's Largest Root and was an indication that the model effect is predominantly associated with one of the dependent variables, and that the effect did not contribute to the model. The follow up univariate test results provided additional information to indicate that the HA Benefits dependent variable was marginally significant and predominantly associated with the effect, $F(2, 387) = 2.97$, p

= .053, partial $\eta^2 = 0.015$. HA Benefits accounted for 1.5 % of the total 1.6% of the variation, while Self-reported Activity level accounted for 0.1% of the remaining variation. The MANOVA contrast comparisons indicate that the EI Composite group in the lowest quartile had significantly lower scores than the other groups, $p \leq .05$.

There is no reason to believe that the equal variance assumption was violated, Box's $M = 9.3$, $F(6, 1049507) = 1.5$, $p = .16$. The MANOVA test results are reported in Table 4.12, the univariate test results are reported in Table 4.13, and the contrast results are reported in Table 4.14.

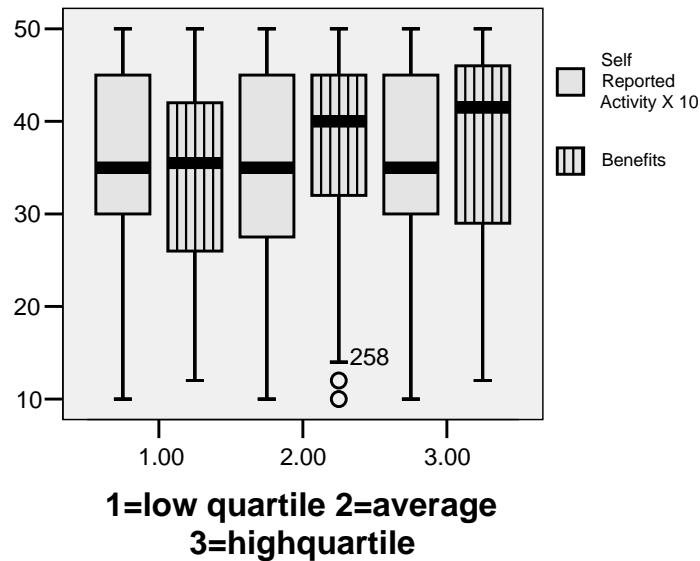


Figure 4.5 Boxplots of EI Composite Categories for the Dependent Variables

Table 4.11 *Descriptive Statistics on EI Composite Categories*

	EI Composite Category 1 Lowest Quartile <i>M (SD)</i>	EI Composite Category 2 Mid Quartiles <i>M (SD)</i>	EI Composite Category 3 Top Quartile <i>M (SD)</i>	Total <i>M (SD)</i>
EI Composite Scale	30.45 (2.37)	35.19 (1.14)	39.12 (1.52)	34.99 (3.47)
HA Benefit	34.10 (9.10)	37.05 (10.10)	37.02 (11.84)	36.30 (10.38)
Self-report exercise activity Level	3.54 (0.98)	3.48 (1.04)	3.55 (1.02)	3.51 (1.02)

Table 4.12 *Multivariate Analysis of Variance of EI Composite Categories*

Test	Value	<i>F</i>	Hypothesis <i>df</i>	Error <i>df</i>	<i>p</i>	<i>Partial</i> η^2
Pillai's Trace	.03	3.19	4	774	.013	.016
Wilks' Lambda	.97	3.21	4	772	.013	.016
Hotelling's Trace	.03	3.22	4	770	.012	.016
Roy's Largest Root	.03	6.35	2	387	.002	.032

Table 4.13 *MANOVA Univariate Test Results*

Source	Dependent Variable	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>	<i>Partial</i> η^2
Contrast	HA Benefits	632.38	2	316.188	2.97	.053	.015
	Self-report activity level	.41	2	0.204	0.20	.82	.001
Error	HA Benefits	41251.53	387	106.593			
	Self-report activity level	401.26	387	1.037			

Table 4.14 *MANOVA Contrast Results*

Contrast		Dependent	Variable
1 = low quartile 2 = middle 3 = high quartile		Benefits	Self-report activity level
1 vs. 3	Contrast Estimate	-2.92	-0.01
	<i>SE</i>	1.48	0.15
	<i>p</i>	.05	.94
1 vs. 2	Contrast Estimate	-2.94	0.06
	<i>SE</i>	1.28	0.13
	<i>p</i>	.02	.64
2 vs. 3	Contrast Estimate	0.03	-0.07
	<i>SE</i>	1.28	0.13
	<i>p</i>	.98	.58

4.6 Summary

The high internal consistency and significant intercorrelation of the EI Composite scale along with the high internal consistency of the HA Benefit provided strong support of the unidimensionality of the measures as well as evidence for validity to use the scales for data analysis and for interpretations of the scale scores.

There were significant correlations between the EI Composite scale and the HA Benefits scale for males but not for females, indicating that there may be a relationship between EI and exercise attitudes for males but not for females.

While the Kinesiology subsamples had a significantly higher mean of self-reported activity level, there was no significant difference in the subsamples mean EI Composite. However, there was some suggestion of a sex effect on EI, and this effect would require further investigation.

Field of study had a significant effect on HA Benefits, but the main effect of sex and the interaction field of study by sex effect were not significant. Finally, while there was a statistical significance from the MANOVA results, the practical significance was trivial. Although the model effect investigating the EI Composite categorical variable on HA Benefits and Self-reported activity level was trivial (partial $\eta^2 = .016$), the effect could be attributed to the lower attitudes towards the benefits of exercise found in the group with the lowest EI Composite scores.

CHAPTER 5: DISCUSSION

This chapter includes an overview of the current study and a discussion of the findings in relation to the research questions considered. In addition, the limitations of the study are presented along with recommendations for further study or investigation.

5.1 Summary of Research Study

The impetus for this study follows from the intense surge of interest on the construct of emotional intelligence to the forefront of both lay and academic communities, creating a zeitgeist that has possibly contributed to impediments in theoretical development. The empirical studies have not been able to keep up with the theoretical conceptualizations. Claims of the contributions of EI are met with speculation in the scientific community due to the paucity of empirical evidence supporting it. Furthermore, EI is conceptualized and measured in a variety of and often, diverging ways. Consequently, it is within the boundaries of the scientific community to attempt to refine and define areas of ambiguity and confusion.

Subsequent to the indication from previous literature that EI shows promise to be linked to the field of health and psychological well-being (Austin, Saklofske, & Egan, 2005), the primary aim of this study was to investigate the concurrent criterion validity of a mixed model conceptualization of EI. The relationship of a mixed model of EI with self-reported exercise attitudes was examined by comparing the mean score of the

Composite EI scale of two subsamples of university students with their self reported attitudes to the benefits of exercise. Data analyses methods included correlation analysis, analyses of variance (ANOVAs) and a multivariate analysis of variance (MANOVA). A secondary purpose of the study was the examination of sex differences in the relationship between EI and exercise attitudes, following indicators of sex differences in health behaviour (IGH, 2003).

The sample was composed of undergraduate students in a Western Canadian university ($N = 398$), ranging in ages from 18 to 29 years of age ($M = 22$) and predominantly female (72%). The sample was divided into two subsamples based on field of study: (1) a nonkinesiology field of study, consisting of mixed levels of exercisers ($n_1 = 271$), and (2) Kinesiology field of study, consisting of a majority of high level exercisers ($n_2 = 127$). To answer the second research question, self-reported exercise activity levels of the subsamples were verified by conducting an ANOVA of the subsamples' self-reported activity levels from a scale of "1" to "5". The mean (4.06) for the Kinesiology subsample was significantly higher than the mean (3.26) of the NonKinesiology subsample, $F(1,395) = 43.23$, $p < .005$.

The two self-report measures, of EI and exercise attitude, used for this study consisted respectively of: (1) the Composite EI scale, as measured with the BarOn EQ-i:S (Bar-On, 2002), and (2) the HA Benefit scale, as measured by the HBQ (Austin, unpublished). The psychometric properties of the measures with the sample were examined and were found to have high internal consistency reliability indexes. A moderately high correlation provided convergent validity evidence of the HA Benefit scale with self-reported activity level.

5.2 Discussion of Research Findings

The initial presentation of the research findings is focused on the primary emphasis of the four research hypotheses that was to investigate the relationship of EI and exercise attitudes in order to provide evidence for concurrent criterion validity. This section is followed by a section that includes the secondary purpose of this study that was to investigate the sex differences in the relationship of EI and exercise attitudes.

5.2.1 EI and Exercise Attitudes

The first of the four research hypotheses was that EI Composite would correlate positively with HA Benefit overall and for all subsamples. In other words, for all groups, the correlation of strong beliefs about the benefits of exercise would correlate positively with a measure claiming to assess high emotional and social effectiveness in dealing with daily demands. The results of a correlation analysis indicated a weak significant correlation ($r = .13$) for the total sample, and representative of the nonkinesiology subsample ($r = .15$). Additionally, a low and significant correlation was found in the male subsample ($r = .37$). However, the results did not translate accordingly across all subsamples, because there were small and nonsignificant results in the female subsample and the kinesiology subsample. The findings, of a weak overall correlation and lack of significant correlations across all subsamples, failed to provide concurrent criterion validity to the BarOn (2002) conceptualization of EI with exercise attitudes.

The initial findings were further substantiated by a lack of significant difference in the mean of Composite EI between a criterion group (the group of high level exercisers) and a mixed group of exercisers. It was hypothesized that the criterion group would have a higher mean in the HA Benefit scale and a higher mean in the EI

Composite scale than the group with mixed levels of exercisers. That is, there would be a group made up of a majority that regularly exercised, who would have stronger beliefs about the benefits of exercise and have higher effectiveness at emotionally and socially dealing with daily demands. It was observed that the criterion group had significantly stronger beliefs about the benefits of exercise as measured by the HA Benefit scale. The means of the criterion group to the mixed group were respectively, 41.94 ($SD = 6.86$) and 33.73 ($SD = 10.70$). However, no significant difference between the means of the Composite EI was found between the groups for the field of study effect or for the interaction effect of field of study \times sex.

Furthermore, it was hypothesized that the mean vector of HA Benefit and Self-reported activity level would be higher for the higher quartile EI Composite group than for the other EI Composite groups: the mid-range quartiles group and the lowest quartile group. In other words, it was expected that a group who strongly believed in the benefits of exercise and exercised regularly would have a higher emotional and social effectiveness in dealing with daily demands. Again, there was a statistically significant, albeit weak finding, accounting for only 1.6% of the variance.

To recapitulate, the findings failed to provide evidence of concurrent criterion validity of Composite EI as defined by the BarOn EQ-i:S with exercise attitudes. As a form of convergent validity, the procedure of concurrent criterion validity was employed to assess whether the BarOn EQ-i:S measure of EI would correlate with an external measure of exercise attitude believed to tap the similar constructs of emotional well-being. Unless the correlation is above .50 and yet not too large to indicate redundancy, evidence for convergent validity is faint; a correlation coefficient equal to

or below .10 is considered trivial (Cohen, 1988). This study lacked empirical evidence to substantiate that the composite scale of the BarOn EQ-i:S was a valid measure of emotional intelligence.

The study did find the instrument to be a good measure with strong internal consistency reliability and large intercorrelations with its components; however, there is uncertainty as to what was being measured. Parker (2001) presented data indicating a moderate association of the BarOn EQ-i:S with personality measures and the questions arising from the current findings provided some weight towards more investigation of the measure falling into the personality domain. These findings are not conclusive and future research is needed to investigate whether the measure is a valid indicator of EI and to determine the measure's uniqueness from existing personality dimensions.

Previous research discussed in the literature review had provided some indications of a link between emotional intelligence and health behaviours. Upon further examination, two primary differences may have contributed to the disagreement in findings: (1) the use of a different EI measure with possibly divergent conceptualizations, and (2) the focus on mental health disorders such as depression.

Previous investigations linking EI with health behaviour used different EI conceptualizations. Ciarrochi, Deane, and Anderson (2002); Austin, Saklofske, and Egan (2005); and Davidson (2004) found significant correlations with EI and health using a measure that was operationalized by a different personality-related EI conceptualization than that used in the current study. Yates (1999), using a measure based upon a conceptualization similar to the ability model, found a weak significance between EI and health behaviour. Finally, a study that found a significant, negative

correlation between high EI and risky health behaviour had used a measure based on the Mayer and Salovey (1997) ability conceptualization of EI (Trinidad & Johnson, 2002). As described earlier, the present study was based on the BarOn (1997, 2002) conceptualization of EI.

Confusion arises in trying to extract theoretical implications due to the differing definitions encountered and was beyond the scope of this study⁴. Matthews, Roberts, and Ziedner (2004) suggested that unless an underlying commonality in the definitions is determined, the differing conceptualizations of EI could in fact be different constructs. The inconsistency in findings underlines the importance for future studies to provide a clear indication of which EI conceptualization is being used in the investigation, as well as the need for studies to compare the various conceptualizations.

Second, disagreements in the findings could be attributed to the current study's focus on positive exercise attitudes versus previous studies' emphasis on disorders associated with stress and depression. Slaski and Cartwright (2002) used the General Health Questionnaire 28 (GHQ 28; Goldberg & Williams, 1988) that assesses for somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. Dawda and Hart (2000) focused on measures of depression and somatic symptomatology in their correlation study with EI. The current study used the HA Benefit factor of the HBQ that concentrates on the positive benefits of exercise.

Parker (2001) indicated that the BarOn EQ-i:S instrument did correlate moderately with the personality dimension of neuroticism that consists of aspects of

⁴ The current study's focus was on the composite scale as a unidimensional measure of EI and did not delve into examining the components beyond the reliability of the measure.

anxiety and depression. Again, the findings of the present study point to concerns of the degree to which the BarOn EQ-i:S measure overlaps with the personality domain.

5.2.2 EI, Exercise Attitudes, and Sex Differences

The secondary purpose of this study was to examine for sex differences in the relationship of EI and exercise attitudes. The secondary component to each research question addressed the issue of sex differences.

Upon finding a weak correlation between EI and exercise attitudes in the total sample, the correlations between the Composite EI and HA Benefit scales for the female and male subsamples were examined. The scales for the female subsample were not significantly correlated; whereas, a low and significant correlation ($r = .37$) was found in the male subsample. The finding is noteworthy and appears to suggest that the contributing factor to the significant, but weak overall correlation, was obtained from the male sector.

In the remaining research questions, no additional significant findings were found to indicate any sex differences. While females did have a slightly higher mean in the Composite EI scale, it was not statistically significant. Additionally, females and males in Kinesiology had stronger beliefs of the benefits of exercise than females and males in the NonKinesiology field of study.

While the findings of this study concurred with previous studies that indicated active people have stronger beliefs about the benefits of exercise, the findings also concurred with Craig and Cameron (2004) that males tend to be more active than females, 55% of the males versus 41% of the females reported an activity level of 4 or more. Denton, Prus, and Walters (2004) also indicated that psychosocial determinants

were more important for females and that behavioural determinants were more important for males. The findings in this study generally concurred and suggest that males are more active, and that their exercise attitudes impact more on their social and emotional well being than for females, affirming that future research involved with health issues continue to investigate sex differences.

5.3 Limitations

The theoretical development of the EI construct is relatively new. This study focused on a mixed model that attempted to define EI as both a fixed trait and ability. As such, these broader conceptualizations could limit the poignancy of the interpretations. Nonetheless, studies with the present framework contribute to enhancing the theoretical developments.

Considerations were made and techniques were implemented to minimize invalidating effects that were threatened due to the nature of a nonexperimental design employed in the methodology of this study. Certain measures were applied to obtain validity and generalizability, but the following points address some of the limitations of this study.

The methodology design included a convenience sample due to the time constraints and to the exploratory nature of this study. However, with additional planning and time, the inclusion of random sampling would have been able to provide regression and/or causal models as well as to strengthen generalizability to the target population and to increase validity of the results.

Generalizability is limited to undergraduates of a western Canadian university within the ages of 18 to 29 years. The inclusion of other age groups and/or longitudinal studies as well as other contexts besides the university setting could have broadened the scope of generalizability.

While self-report measurement is robust and widely accepted as a personality measure, it is not a traditional assessment form of intelligence. A weakness from self-report measures arises from when the possibility that the judgements could be biased and unreliable. Although procedures were implemented within the data validation process to reduce this limitation, this study could have been strengthened by triangulation with the inclusion of observation-based reports and/or performance assessment.

As a final point, the exercise attitude measurement was a scale taken from the HBQ (Austin, unpublished), an experimental questionnaire. While the questionnaire was based on the robust and well established HBM, validity and reliability studies have not been published to date and information regarding its robustness for specific use with exercise attitudes is lacking. Procedures were implemented to check the measure for validity and reliability and, as is conventional within HBM, a composite scale of the four factors was not used.

5.4 Implications for Practice and Future Research

Even though this study failed to find empirical evidence to substantiate claims for the BarOn (1997, 2002) mixed model conceptualization of EI association with health and well being marked by positive exercise attitudes, the main implications are

twofold. To begin with, this study underlines the importance for further investigations to focus on the refining and defining the theoretical frameworks of EI. Second, this study points to the importance of examining the disparity between the sexes in their exercise attitudes impacting their emotional well being.

Four recommendations for future study would include: (1) comparative studies of the different EI conceptualizations, (2) replications of this study with other EI models, (3) studies examining the overlap of EI personality models with personality measures, and (4) studies examining the sex differences of the influences of exercise activity on emotional well being. In all cases, it is further recommended that the specific conceptualization of EI be identified and well defined, rather than a generalization or blanket approach to the understanding of EI.

5.5 Conclusion

With empirical evidence for validity, EI has the potentiality to contribute to understanding of health behaviour. This study provides some insights into the relationship of EI as conceptualized by the Bar-On (1997, 2002) and attitudes to the benefits of exercise. The results of this study continue to magnify the lack of empirical evidence to substantiate a current mixed model conceptualization of EI along with the need for more theoretical developments. On the other hand, the study's results underscore the importance of promoting stronger beliefs in the benefits of exercise as it does contribute to higher activity levels beneficial to health. In addition, noteworthy and significant findings point to sex differences in the perception of the benefits of exercise along with emotional and social effectiveness in dealing with daily demands.

The scientific community is faced with the responsibility of sifting through the current flood of information to discriminate the viable from the sensational. Emotions and reason have been at opposite ends of a paradigm for centuries, and it is hoped that this study contributes to the empirical evidence of finding a place for the two to meet.

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Appendix A: Ethics Approval

	<p>University of Saskatchewan Research Ethics Board (Behavioural) Room 308 Kirk Hall 117 Science Place SASKATOON SK S7N 5C8</p>	
<h3 style="margin: 0;">STATUS REPORT FORM</h3>		
<p>This form is submitted for the following purpose</p> <p><u> X </u> Annual status report.</p> <p>Notice of study closure. When was the ethics approval for this study due to expire? Expiry Date: <u>February 1, 2005</u></p> <p>The ongoing review requirement stipulated that a status report must be submitted within the one year anniversary date of: February, 2004</p> <p>Report Prepared by: Dr. Donald H. Saklofske Date: January 17, 2005</p>		
<p>1. PRINCIPAL INVESTIGATOR</p> <p>Dr. Don Saklofske and Betty Rohr (Graduate Student)</p>		
<p>2. DEPARTMENT/DIVISION Educational Psychology and Special Education</p>		<p>3. Beh/BSC # BEH03-832</p>
<p>4. TITLE OF STUDY</p> <p>Emotional Intelligence: Associations with personality and exercise</p>		
<p>5. SPONSOR (where applicable) n/a</p>		
<p>6. BRIEF SUMMARY OF PROGRESS OF STUDY (projected completion date for recruitment and data collection, number of subjects admitted to date, target enrollment, anticipated end-date).</p> <p>To date we have made good progress with this study and collected data on some 300 students. Kammy Davidson completed her thesis and defense. To ensure the robustness of the preliminary findings, we have decided to collect further data and essentially replicate this study. To this extent, Betty Rohr, a graduate student in the Dept. of Educational Psychology and Special Education will be given the opportunity to use these data for her thesis. The study will remain exactly as before with the same questionnaire, consent form and research methodology. We anticipate collecting another 200-300 questionnaires and hopefully will complete this study by the end of 2005.</p>		
<p>7. ARE THERE ANY ASPECTS OF THIS STUDY WHICH SHOULD BE BROUGHT TO THE ATTENTION OF THE Beh-REB (i.e. Was there any difficulty implementing the project as planned, were there any complaints from research participants or did they experience any unexpected emotional distress? Were there any other ethical concerns)? Note: Please attach additional pages as needed.</p> <p>NO... this study is a replication of the project approved, in modified form, at this time last year</p>		
<p>8. PRINCIPAL INVESTIGATOR</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Signature: <u>[Signature]</u></p> </div> <div style="width: 45%;"> <p>Date: <u>Jan 17/05</u></p> </div> </div>		
<p>ONGOING REVIEW REQUIREMENTS: This status report is valid for up to one year. The REB will require the submission of an annual status report within one month of the anniversary date. <u>Please note</u> if the Status Report Form is not submitted by the one-year anniversary date, the ethics certificate will automatically be invalidated.</p>		
<p>For Administrative Use Only:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Approved On: <u>January 18, 2005</u></p> </div> <div style="width: 45%;"> <p>Expiry Date: <u>February 1, 2006</u></p> </div> </div> <p>Signature of Chair or designate: <u>[Signature]</u></p>		
<p>June 2002</p>		

Appendix B: Consent Form

You are invited to participate in a study entitled *Emotional Intelligence: Associations with personality and exercise*. Please read this form carefully, and feel free to ask questions you might have.

The purpose of this study is to examine the relationship between various measures that assess the way people think and feel about themselves and others, and their health and exercise – related beliefs, and behaviours. To this end, you are being asked to respond to a set of self-report questions and statements. These will provide the most accurate information about your feelings and thoughts. Your participation in this study will significantly contribute to the research program associated with the current study. There are no known risks or direct personal benefits associated with this study.

Individuals choosing to participate in this study will be required to sign this consent form. A copy of such will be provided for your own records. Participants will then be asked to respond to a given set of self-report measures. Specific instructions as to how to correctly respond to each measure are provided on the questionnaire form. It is expected that completion of these measures will take approximately 20-30 minutes.

Your identity will be kept in complete confidence. Other than this consent form, which will be stored separately from the set of self-report measures, you will not be asked to place your name or any other specific identifying information on any other material used during the course of this study. Only your age, sex, and year of study will be required. The results of all measures will be strictly anonymous. Study results and all related materials will be safeguarded and stored by Dr. D. H. Saklofske in a secure

location at the University of Saskatchewan for a minimum of five years upon the completion of this study as per university policy.

Participation in this study is strictly voluntary. Individuals participating in this study are free to withdraw from the study for any reason, at any time, without penalty of any sort. Withdrawal from the study shall not in any way affect academic status or access to any services that the university provides. Any information provided by a participant who chooses to subsequently withdraw from the study will be excluded from the study and destroyed.

Data collected during this study are part of an ongoing study of emotional intelligence. Aggregate data may be presented at future conferences and/or in the publication of journal articles or related studies. Given that participant names will not in any way be associated with the self-report measures, information regarding individual scores on any of the measures will not be available. However, for those individuals interested in the overall results of this study, this information will be made available through Dr. D. H. Saklofske. Further, the completed thesis will also be available for loan at the General Office of the Department of Educational Psychology and Special Education.

If you have any questions concerning this study, please feel free to ask at any point; you are also free to contact the researcher if you have questions at later time. This study has been approved by the University of Saskatchewan Behavioural Sciences Research Ethics Board on February 25, 2004. Any questions regarding your rights as a participant may be addressed to that committee through the Office of Research Services (966-2084).

I have read and understood the description provided above; I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study described above, with the understanding that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records.

_____	_____
Participant signature	Date

Principal Investigator

Appendix C: Computation Equations for Scales

Calculation of EI factor scale scores and HA Benefit scores involved multiplying the mean by the number of items in the scale to adjust for missing items, following the method described in the *BarOn EQ-i:S Technical Manual* (2002). For example, the formula used to compute the Intrapersonal Scale (eqB), with ten items in the scales, was:

$$\text{eqB} = \text{MEAN} (\text{eq2}, \text{eq8}, \text{eq14}, \text{eq20}, \text{eq25}, \text{eq32}, \text{eq38}, \text{eq43}, \text{eq47}, \text{eq51}) \times 10 \quad (\text{C1})$$

The formula to compute the Stress Management Scale (eqC) which has eight items was:

$$\text{eqC} = \text{MEAN} (\text{eq4}, \text{eq10}, \text{eq16}, \text{eq22}, \text{eq28}, \text{eq34}, \text{eq40}, \text{eq45}) \times 8. \quad (\text{C2})$$

The Health Attitude to the benefits of exercise (HA Benefit), consisting of 10 items, was computed in the same manner:

$$\text{HA Benefit} = \text{MEAN}(\text{h1}, \text{h3}, \text{h11}, \text{h20}, \text{h24}, \text{h26}, \text{h29}, \text{h31}, \text{h37}, \text{h39}) \times 10. \quad (\text{C3})$$

The EI Composite score is calculated by summing the five factor scores and dividing the result by five, as described in the *BarOn EQ-i:S Technical Manual* (2002):

$$\text{EI Composite} = (\text{SUM}(\text{eqA}, \text{eqB}, \text{eqC}, \text{eqD}, \text{eqE})) / 5. \quad (\text{C4})$$

Finally, the Self-reported Activity Level was measured by the mean of item 5 and item 18 of the HBQ:

$$\text{Self-reported Activity Level} = (\text{h5} + \text{h18})/2 \quad (\text{C5})$$